

depressed below adjacent paved grades unless provisions for drainage, such as catch basins and drains, are made. Adequate drainage gradients, devices, and curbing should be provided to prevent runoff from adjacent pavement or walks into planting areas.

Watering should be done in a uniform, systematic manner as equally as possible on all sides of the foundation, to keep the soil moist. Irrigation methods should promote uniformity of moisture in planters and beneath adjacent concrete flatwork. Overwatering and underwatering of landscape areas must be avoided. Areas of soil that do not have ground cover may require more moisture, as they are more susceptible to evaporation. Ponding or trapping of water in localized areas adjacent to the foundations can cause differential moisture levels in subsurface soils and, therefore, should not be allowed. Trees located within a distance of 20 feet of foundations would require more water in periods of extreme drought, and in some cases, a root injection system may be required to maintain moisture equilibrium. During extreme hot and dry periods, close observations should be carried out around foundations to ensure that adequate watering is being undertaken to prevent soil from separating or pulling back from the foundation.

5.11 Construction Observation and Testing and Plan Review

The geotechnical consultant should perform construction observation and testing during the fine, and post grading operations, future excavations and foundation or retaining wall construction at the site. Additionally, footing excavations should be observed and moisture determination tests of the slab subgrade soils should be performed by the geotechnical consultant prior to the pouring of concrete. Foundation design plans should also be reviewed by the geotechnical consultant prior to excavations.

6.0 LIMITATIONS

The recommendations contained in this report are based on available project information. Changes made during design development, should be reviewed by Leighton Consulting, Inc. to determine if recommendations are still applicable. Any questions regarding the contents of this report should be directed to the attention of Mike Jensen, CEG, (858) 300-8494 of Leighton and Associates, Inc.

The nature of many sites is such that differing geotechnical or geological conditions can occur over small areal distances and under varying climatic conditions. The conclusions and recommendations in this report are based in part upon data that were obtained from a limited number of observations, site visits, excavations, samples, and tests. Such information is by necessity incomplete and therefore preliminary. The findings, conclusions, and recommendations presented in this report are considered preliminary and can be relied upon only if Leighton has the opportunity to observe the subsurface conditions during grading and construction of the proposed improvements, in order to confirm that our preliminary findings are representative for the site.

This report was prepared for the sole use of JPI for application to the design of the proposed improvements in accordance with generally accepted geotechnical engineering practices at this time in California.

Our evaluation was limited to assessment of the preliminary geotechnical aspects of the project and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

In addition, we recommend that the GBC insert included in Appendix G be reviewed prior to the utilization of this report.

APPENDIX A

References

APPENDIX A

References

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APPENDIX A (Continued)

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Aerial Photographs

Date	Source	Flight	Photo Number
5-2-53	USDA	AXN-14	36-38

Figure



Project: 12085.002	Eng/Geol: WDO/MDJ
Scale: 1" = 2,000'	Date: September 2019
Base Map: ESRI ArcGIS Online 2019	
Author: (mmurphy)	

SITE LOCATION MAP JPI Ocean Creek Oceanside California

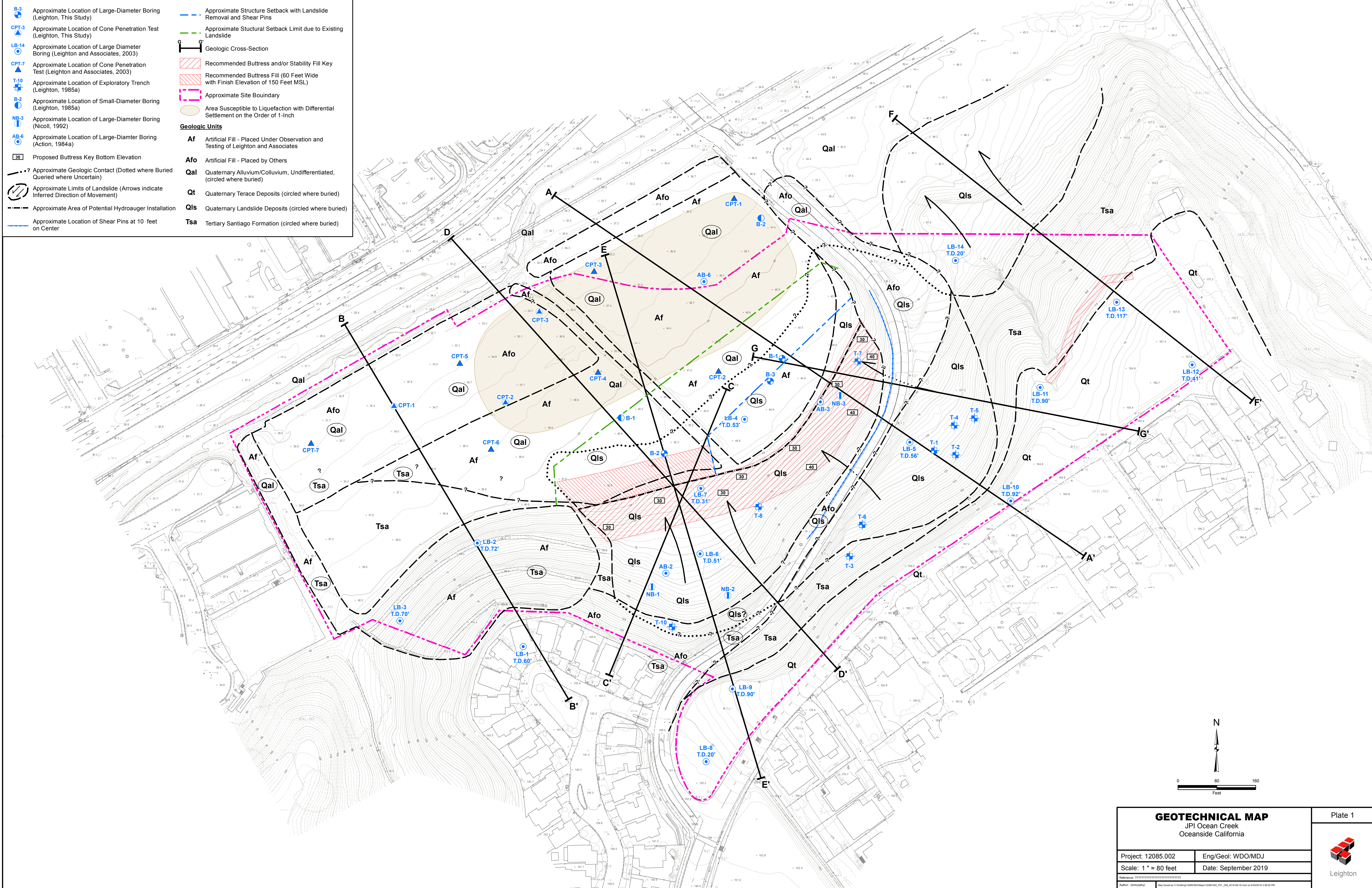
Figure 1

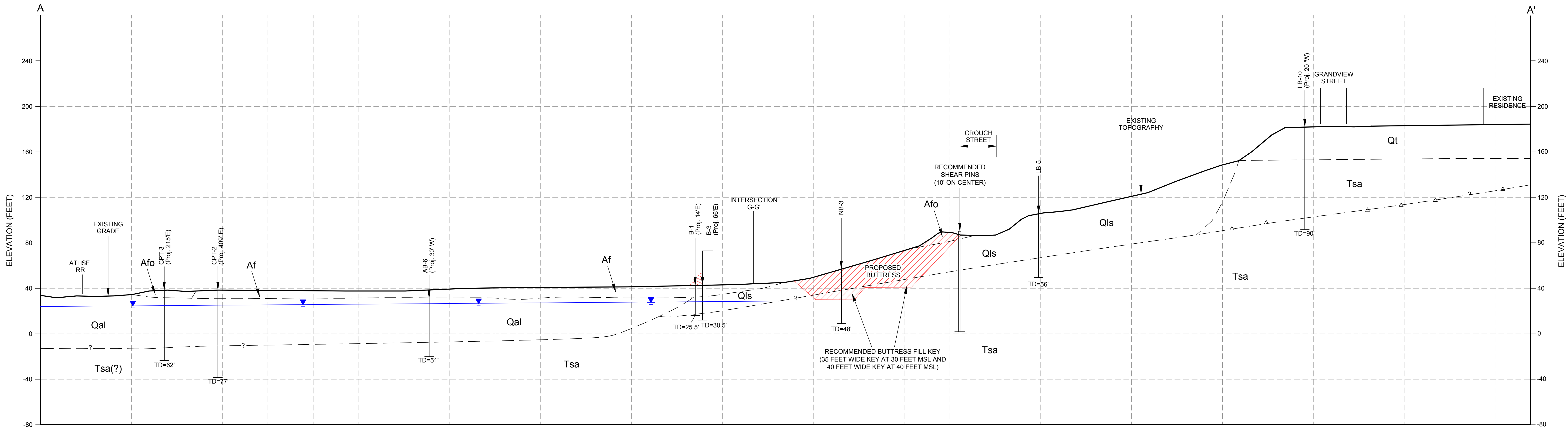


Leighton

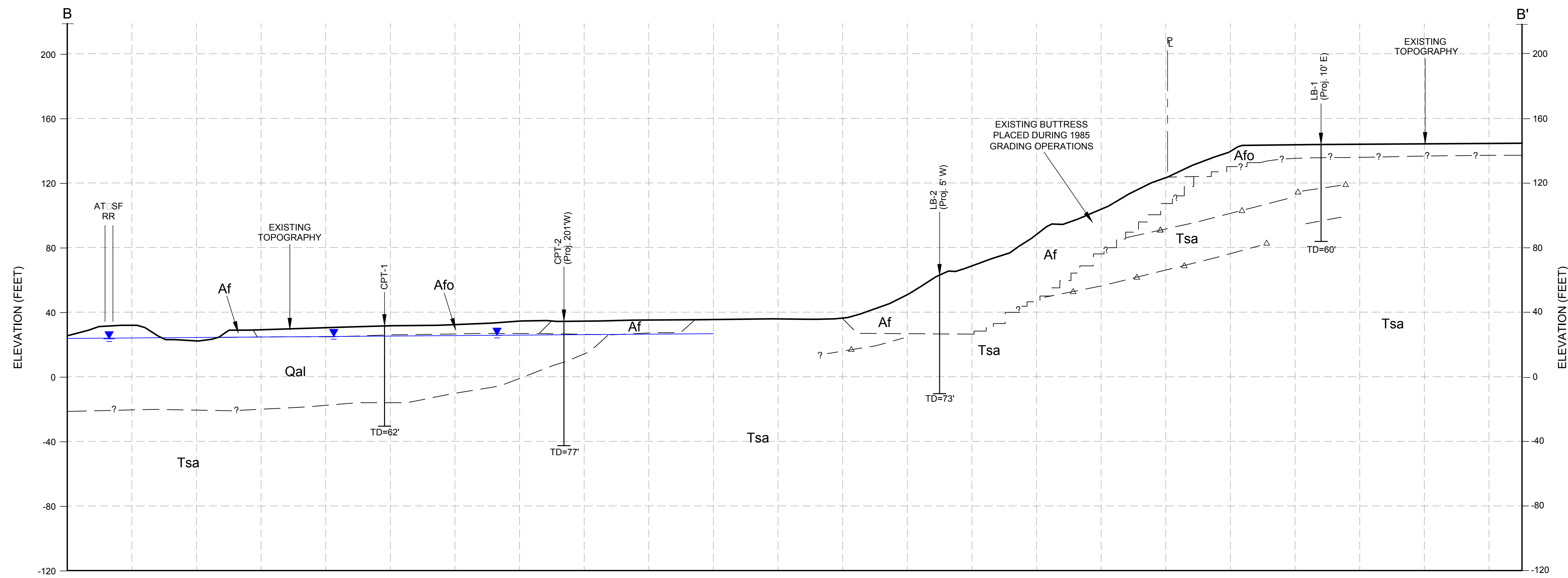
Plates

	Approximate Location of Large-Diameter Boring (Leighton, This Study)		Approximate Structure Setback with Landslide Removal and Shear Pins
	Approximate Location of Cone Penetration Test (Leighton, This Study)		Approximate Structural Setback Limit due to Existing Landslide
	Approximate Location of Large Diameter Boring (Leighton and Associates, 2003)		Geologic Cross-Section
	Approximate Location of Cone Penetration Test (Leighton and Associates, 2003)		Recommended Buttress and/or Stability Fill Key
	Approximate Location of Exploratory Trench (Leighton, 1985a)		Recommended Buttress Fill (60 Feet Wide with Finish Elevation of 150 Feet MSL)
	Approximate Location of Small-Diameter Boring (Leighton, 1985a)		Approximate Site Boundary
	Approximate Location of Large-Diameter Boring (Nicoll, 1992)		Area Susceptible to Liquefaction with Differential Settlement on the Order of 1-Inch
	Approximate Location of Large-Diameter Boring (Action, 1984a)	<u>Geologic Units</u>	
	Proposed Buttress Key Bottom Elevation	Af	Artificial Fill - Placed Under Observation and Testing of Leighton and Associates
	Approximate Geologic Contact (Dotted where Buried Queried where Uncertain)	Afo	Artificial Fill - Placed by Others
	Approximate Limits of Landslide (Arrows indicate Inferred Direction of Movement)	Qal	Quaternary Alluvium/Colluvium, Undifferentiated, (circled where buried)
	Approximate Area of Potential Hydroauger Installation	Qt	Quaternary Terrace Deposits (circled where buried)
	Approximate Location of Shear Pins at 10 feet on Center	Qls	Quaternary Landslide Deposits (circled where buried)
		Tsa	Tertiary Santiago Formation (circled where buried)

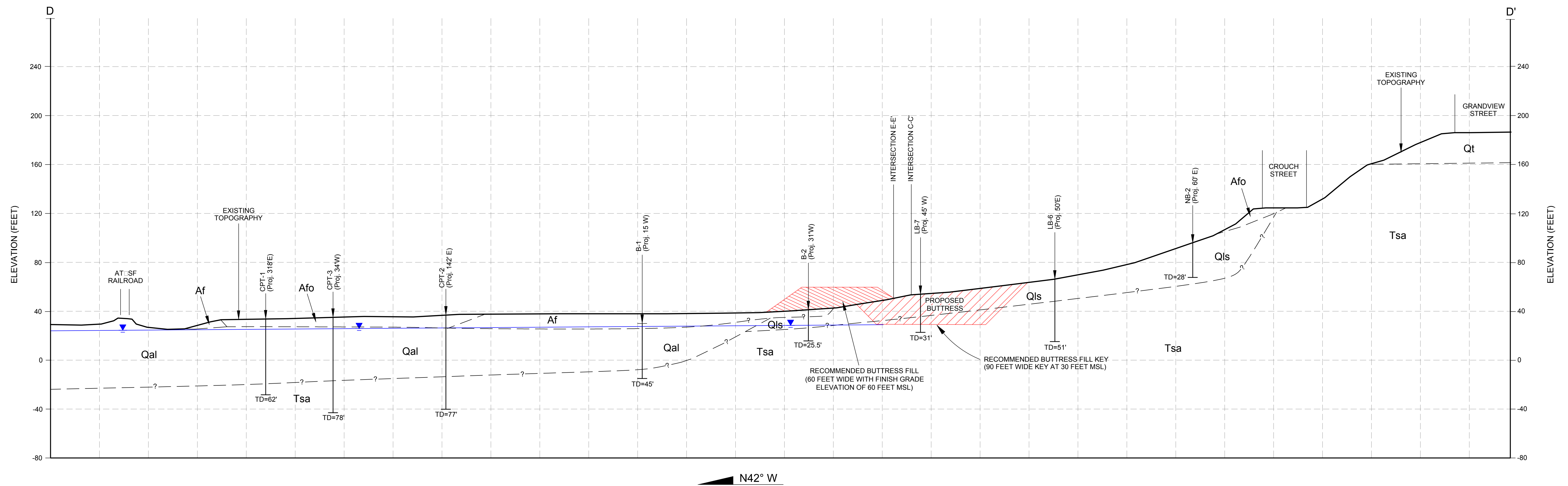
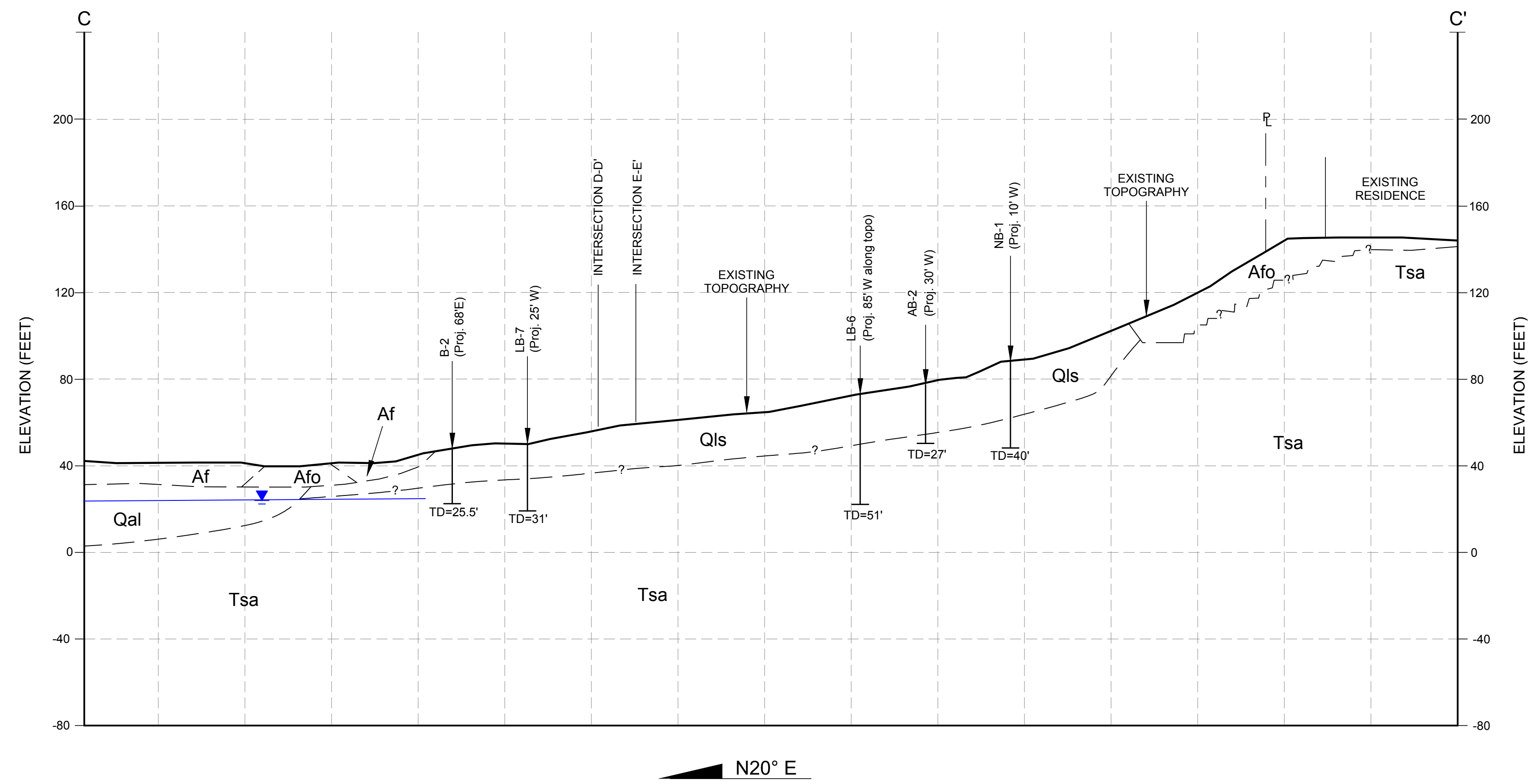


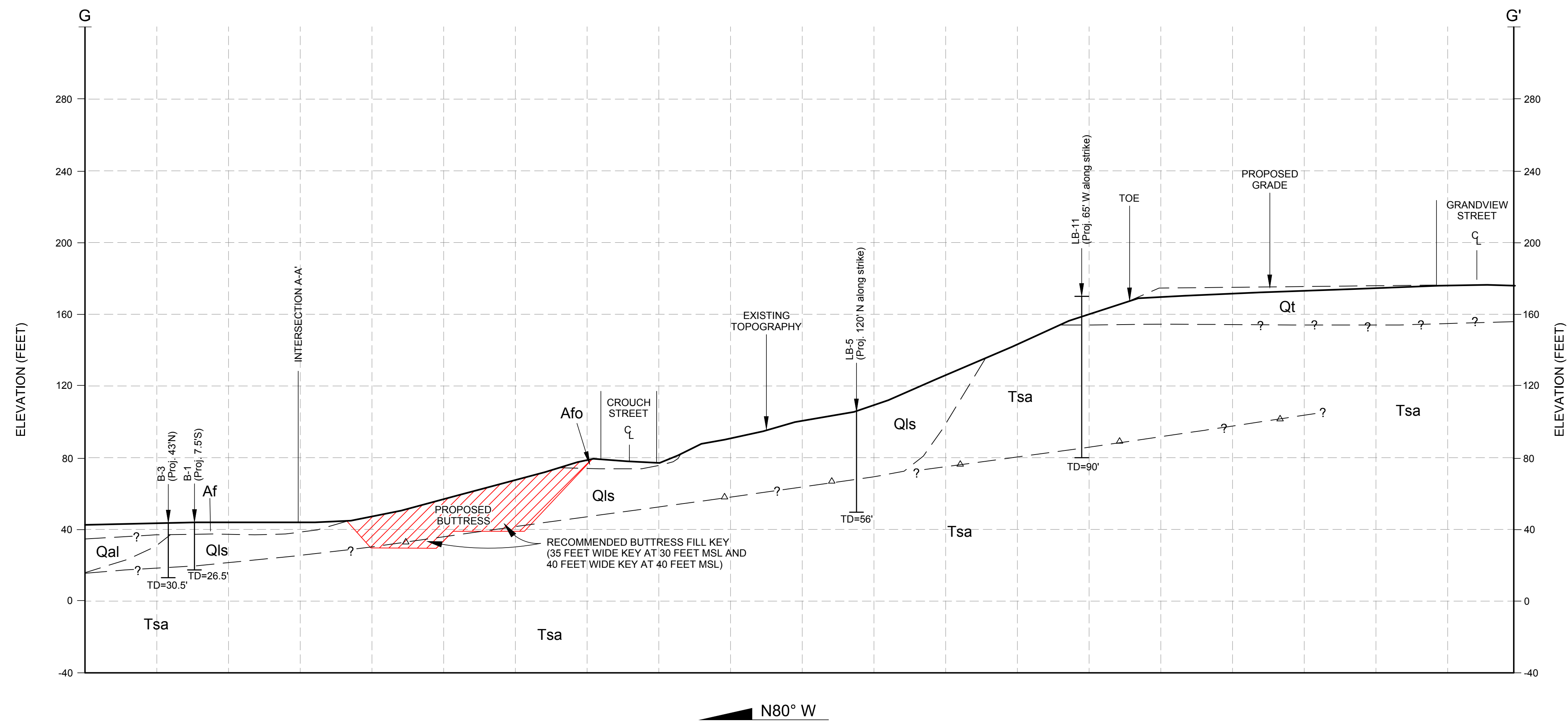


N55° W



N30° W





Appendix B

Current Explorations

Appendix B (Continued)

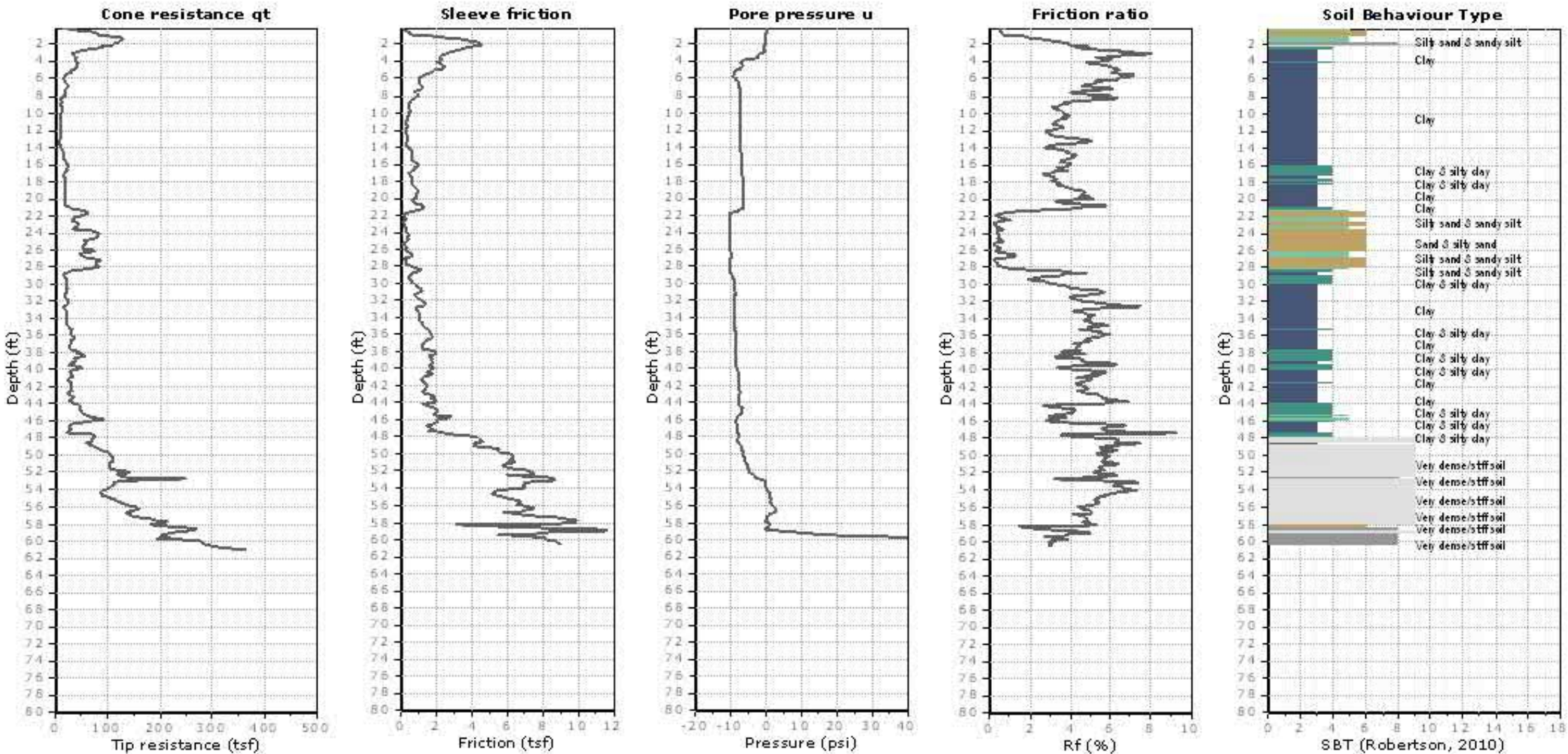
CPT-1 through CPT-3



Project: Leighton & Associates - JPI Ocean Creek Town Center
Location: Oceanside, CA

CPT-1

Total depth: 60.96 ft, Date: 8/2/2019





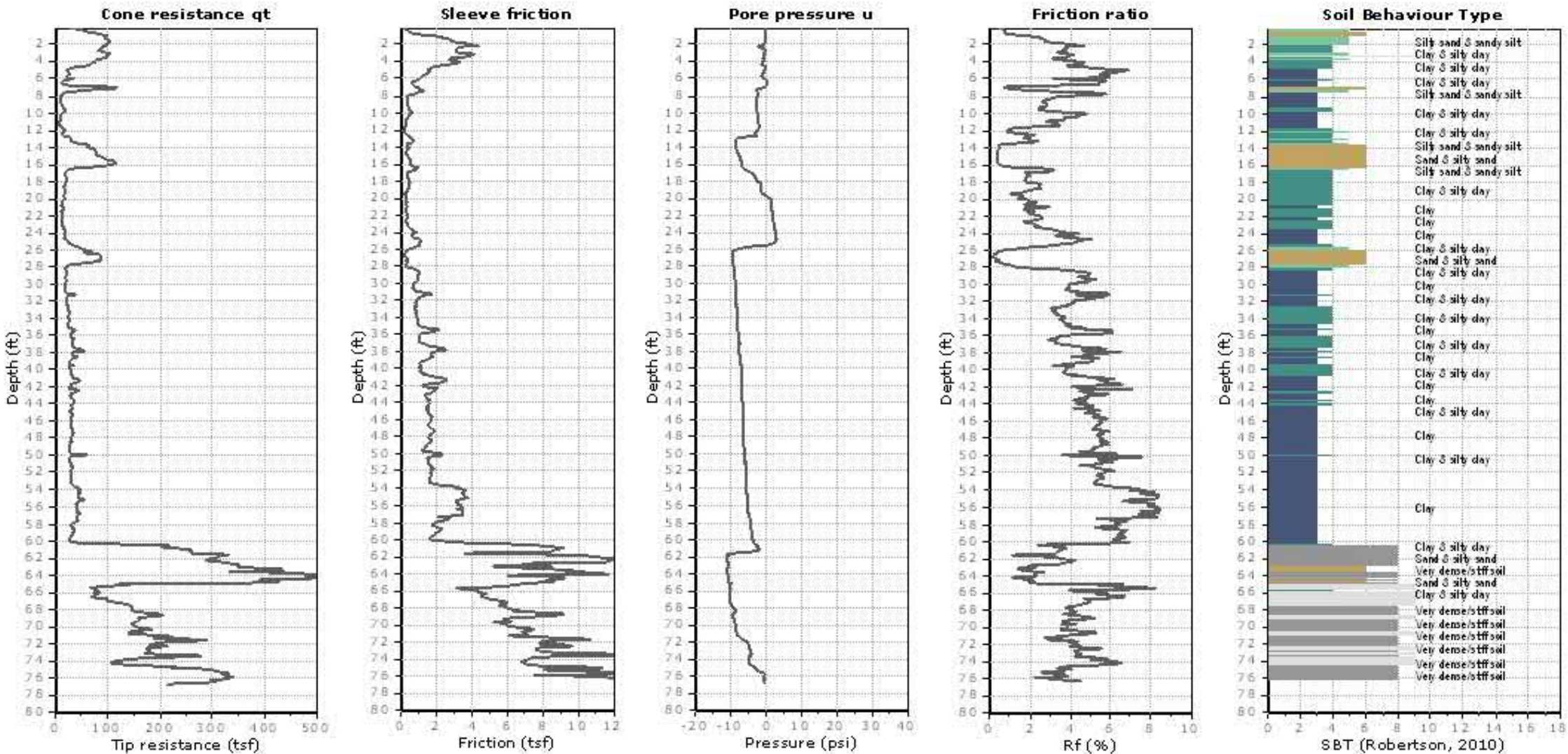
Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: Leighton & Associates - JPI Ocean Creek Town Center

Location: Oceanside, CA

CPT-2

Total depth: 76.72 ft, Date: 8/2/2019





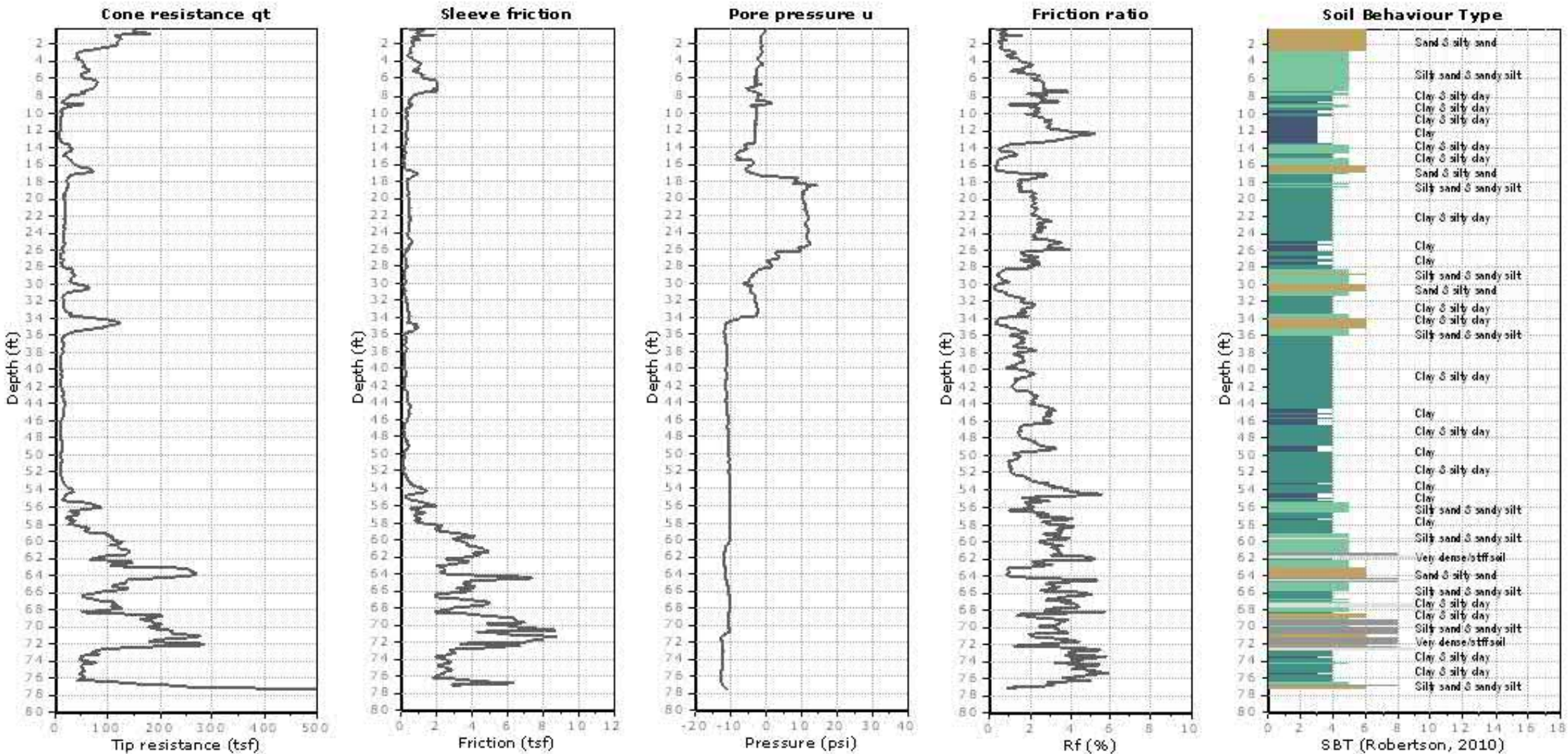
Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: Leighton & Associates - JPI Ocean Creek Town Center

Location: Oceanside, CA

CPT-3

Total depth: 77.50 ft, Date: 8/2/2019



Appendix B (Continued)

Large Diameter Borings B-1 through B-3

GEOTECHNICAL BORING LOG KEY

Date _____ Sheet 1 of 1
 Project _____ KEY TO BORING LOG GRAPHICS Project No. _____
 Drilling Co. _____ Type of Rig _____
 Hole Diameter _____ Drive Weight _____ Drop _____
 Elevation Top of Elevation _____ Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By _____ Sampled By _____	
	0								Asphaltic concrete.	
									Portland cement concrete.	
								CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay.	
								CH	Inorganic clay; high plasticity, fat clays.	
	5							OL	Organic clay; medium to plasticity, organic silts.	
								ML	Inorganic silt; clayey silt with low plasticity.	
								MH	Inorganic silt; diatomaceous fine sandy or silty soils; elastic silt.	
								ML-CL	Clayey silt to silty clay.	
								GW	Well-graded gravel; gravel-sand mixture, little or no fines.	
	10							GP	Poorly graded gravel; gravel-sand mixture, little or no fines.	
								GM	Silty gravel; gravel-sand-silt mixtures.	
								GC	Clayey gravel; gravel-sand-clay mixtures.	
								SW	Well-graded sand; gravelly sand, little or no fines.	
								SP	Poorly graded sand; gravelly sand, little or no fines.	
	15							SM	Silty sand; poorly graded sand-silt mixtures.	
								SC	Clayey sand; sand-clay mixtures.	
									Bedrock.	
	20			B-1					Ground water encountered at time of drilling.	
				B-1					Bulk Sample 1.	
				C-1					Bulk Sample 2.	
				G-1					Core Sample.	
				R-1					Grab Sample.	
				SH-1					Modified California Sampler (3" O.D., 2.5 I.D.).	
	25			S-1					Shelby Tube Sampler (3" O.D.).	
				PUSH					Standard Penetration Test SPT (Sampler (2" O.D., 1.4" I.D.).	
									Sampler Penetrates without Hammer Blow.	
	30								Bulk Sample 2.	

SAMPLE TYPES:

S SPLIT SPOON

R RING SAMPLE

B BULK SAMPLE

T TUBE SAMPLE

TYPE OF TESTS:

DS DIRECT SHEAR

MD MAXIMUM DENSITY

CN CONSOLIDATION

CR CORROSION

SA SIEVE ANALYSIS

AT ATTERBURG LIMITS

EI EXPANSION INDEX

RV R-VALUE

LEIGHTON



GEOTECHNICAL BORING LOG B-1

Project No. 12085.002
Project JPI Oceancreek
Drilling Co. Tri-Valley Drilling, Inc.
Drilling Method Bucket Auger
Location See Map

Date Drilled 7-29-19
Logged By XR
Hole Diameter 30"
Ground Elevation 42'
Sampled By XR

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							<i>This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.</i>	
0	0							SM	ARTIFICIAL FILL (Af) @ 0'-2.9': Silty SAND, medium dense, brown, dry to damp, fine-grained, native and concrete clasts	
40									@ 5': Sandy SILT	
5									@ 6.7'-7.2': Silty SAND, light brown, near horizontal	
35									@ 8.2': Concretion 2 to 3" bed with clasts of SANDSTONE in silty SAND fill, light brown, medium dense, poorly-graded	
10				R-1	1@6" 1@6"			SM	QUATERNARY LANDSLIDE (Qls) @ 9.8': Silty SAND, dark brown, rootlets @ 10': Silty SAND, light brown, gravel-sized clasts of SANDSTONE nearly horizontal layer, discontinuous around the boring	
30				R-2	Push 1@6"				@ 14.5': Heavy caving, silty SAND, medium dense, heavy seepage, red-brown, fine-grained, moist, friable Unable to geologically log below 14.5' @ 15': Silty SAND, loose, orange-brown, wet, roots, friable, iron-oxide blebs	
15										
25										
20								ML	@ 20': SILTSTONE, gray-brown, intact, possible landslide	
20										
25				R-3	1@6" 2@6"			SM	TERTIARY SANTIAGO FORMATION (Tsa) @ 25': Silty SANDSTONE, medium dense, gray-brown, wet, micaceous, fine-grained, calcium-carbonate blebs/stringers	
15								ML	@ 26': SILTSTONE with interbedded SAND, medium dense, gray-brown	
30									Total Depth = 26.5 Feet Groundwater and Seepage Encountered at 14 Feet at Time of Drilling Backfilled with Bentonite and Native Soil on 7/29/19	

SAMPLE TYPES:

B BULK SAMPLE
 C CORE SAMPLE
 G GRAB SAMPLE
 R RING SAMPLE
 S SPLIT SPOON SAMPLE
 T TUBE SAMPLE

TYPE OF TESTS:

-200 % FINES PASSING
 AL ATTERBERG LIMITS
 CN CONSOLIDATION
 CO COLLAPSE
 CR CORROSION
 CU UNDRAINED TRIAXIAL

DS DIRECT SHEAR
 EI EXPANSION INDEX
 H HYDROMETER
 MD MAXIMUM DENSITY
 PP POCKET PENETROMETER
 RV R VALUE

SA SIEVE ANALYSIS
 SE SAND EQUIVALENT
 SG SPECIFIC GRAVITY
 UC UNCONFINED COMPRESSIVE STRENGTH



GEOTECHNICAL BORING LOG B-2

Project No. 12085.002
 Project JPI Oceancreek
 Drilling Co. Tri-Valley Drilling, Inc.
 Drilling Method Bucket Auger
 Location See Map

Date Drilled 7-29-19
 Logged By XR
 Hole Diameter 30"
 Ground Elevation 44'
 Sampled By XR

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							<i>This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.</i>	
	0							SM	@ 0-5": TOPSOIL ARTIFICIAL FILL (Af) @ 5": Silty SAND, concrete, brick debris, gray-brown, dry, fine-grained	
40	5			R-1					@ 5": Silty SAND, loose, light gray-brown, moist, fine-grained	
35									@ 8": Becomes red-brown	
10	10			R-2				SM	QUATERNARY LANDSLIDE DEPOSITS (Qls) @ 9": Disturbed bed broken modeled SANDSTONE not intact 9'-11'	
								SP	@ 10": Silty SAND, light orange-brown, moist @ 11": Moderate caving oxidized on sand layer @ 11.6": Friable SAND, mottled but not intact	
30								CL	@ 13": Sandy SILT with a 2" thick plastic clayseam dipping N, calcium-carbonate blebs stringers	
15			RS:N80E, 10-11NW					SM	@ 15": Silty SANDSTONE, light gray-brown, wet	
								ML	@ 15.2": Landslide rupture surface 1/2" thick CLAYSEAM, around entire boring, moderate seepage along bottom of landslide SANTIAGO FORMATION (Tsa) @ 15.8": SILTSTONE, dense, intact	
25									@ 20": SILTSTONE, hard, gray-brown, intact	
20								SM	@ 22": Silty SANDSTONE, very dense light brown	
20										
25								SP	@ 25": Poorly-graded SANDSTONE, light gray, micaceous	
15									Total Depth = 25.5 Feet Groundwater and Seepage Encountered at 14 Feet at Time of Drilling Backfilled with Bentonite and Native Soil on 7/29/19	
30										

SAMPLE TYPES:

B BULK SAMPLE
 C CORE SAMPLE
 G GRAB SAMPLE
 R RING SAMPLE
 S SPLIT SPOON SAMPLE
 T TUBE SAMPLE

TYPE OF TESTS:

-200 % FINES PASSING
 AL ATTERBERG LIMITS
 CN CONSOLIDATION
 CO COLLAPSE
 CR CORROSION
 CU UNDRAINED TRIAXIAL

DS DIRECT SHEAR
 EI EXPANSION INDEX
 H HYDROMETER
 MD MAXIMUM DENSITY
 PP POCKET PENETROMETER
 RV R VALUE

SA SIEVE ANALYSIS
 SE SAND EQUIVALENT
 SG SPECIFIC GRAVITY
 UC UNCONFINED COMPRESSIVE STRENGTH



GEOTECHNICAL BORING LOG B-3

Project No. 12085.002
Project JPI Oceancreek
Drilling Co. Tri-Valley Drilling, Inc.
Drilling Method Bucket Auger
Location See Map

Date Drilled 7-30-19
Logged By XR
Hole Diameter 30"
Ground Elevation 44'
Sampled By XR

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests		
<i>This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.</i>												
0	0	N S						SM	ARTIFICIAL FILL (Af) @ 0': Silty SANDSTONE, light gray-brown, dry, fine-grained			
40	5			R-1	1			CL	@ 3.8': CLAY 4", dark brown @ 3.9': SAND, white, friable @ 5': Silty SAND, brown, moist, fine-grained @ 5.8': Disturbed zone, silty SAND, dark brown			
35	10			R-2	1			SC	@ 7.8': SAND bed, brown, micaceous, clasts of native formation @ 8': Sandy CLAY, medium stiff, dark brown, moist, Possible Topsoil			
30	15		N60W 65 degrees	R-3	1			SM	QUATERNARY LANDSLIDE DEPOSITS (Qls) @ 10': Silty SANDSTONE, orange-brown, charcoal, fine-grained, micaceous @ 10.3': Silty SAND, medium dense, dark brown, moist, slightly oxidized @ 11.3': Charcoal and wood chunks @ 14': SANDSTONE clasts 4" high, calcium-carbonate blebs stringers, loose @ 14.7': Highly fractured SILTSTONE, calcium-carbonate blebs, dark gray-brown, moist, randomly fractured, heavy seepage along fractures, calcium-carbonate stringers. @ 15.5': Silty SAND			
25	20		CS: N40W 15-20 degrees RS: N45E 15-17 degrees	R-4	1			ML	@ 19.8'-20.2': Highly sheared CLAYSTONE, polished, striated, dark gray to red-gray, remolded CLAYSEAM @ 20.2': 1.5 to 2" thick CLAYSEAM, dark brown, moist, high plasticity, heavy moderate seepage along clayseam and fractures, caving @ 20.3': SILTSTONE, light gray, manganese			
20	25			R-5	2			ML	TERTIARY SANTIAGO FORMATION @ 21': Denser material SANDSTONE, light gray @ 25': SILTSTONE, very hard, light green-gray, micaceous @ 26': Standing water			
15	30											
SAMPLE TYPES: B BULK SAMPLE C CORE SAMPLE G GRAB SAMPLE R RING SAMPLE S SPLIT SPOON SAMPLE T TUBE SAMPLE										TYPE OF TESTS: -200 % FINES PASSING AL ATTERBERG LIMITS CN CONSOLIDATION CO COLLAPSE CR CORROSION CU UNDRAINED TRIAXIAL	DS DIRECT SHEAR EI EXPANSION INDEX H HYDROMETER MD MAXIMUM DENSITY PP POCKET PENETROMETER RV R VALUE	SA SIEVE ANALYSIS SE SAND EQUIVALENT SG SPECIFIC GRAVITY UC UNCONFINED COMPRESSIVE STRENGTH

SAMPLE TYPES:

B BULK SAMPLE
 C CORE SAMPLE
 G GRAB SAMPLE
 R RING SAMPLE
 S SPLIT SPOON SAMPLE
 T TUBE SAMPLE

TYPE OF TESTS:

-200 % FINES PASSING
 AL ATTERBERG LIMITS
 CN CONSOLIDATION
 CO COLLAPSE
 CR CORROSION
 CU UNDRAINED TRIAXIAL

DS DIRECT SHEAR
 EI EXPANSION INDEX
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 MD MAXIMUM DENSITY
 PP POCKET PENETROMETER
 RV R VALUE

SA SIEVE ANALYSIS
 SE SAND EQUIVALENT
 SG SPECIFIC GRAVITY
 UC UNCONFINED COMPRESSIVE STRENGTH



GEOTECHNICAL BORING LOG B-3

Project No.	12085.002	Date Drilled	7-30-19
Project	JPI Oceancreek	Logged By	XR
Drilling Co.	Tri-Valley Drilling, Inc.	Hole Diameter	30"
Drilling Method	Bucket Auger	Ground Elevation	44'
Location	See Map	Sampled By	XR

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							<i>This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.</i>	
30		. . .		R-6	5 10			SM	@ 30': SILTSTONE, very dense, light brown, micaceous Geologically Logged to 25.5 Feet Total Depth = 30.5 Feet Groundwater and Seepage Encountered at 15 Feet at Time of Drilling Backfilled with Bentonite and Native Soil on 7/30/19	
10										
35										
5										
40										
0										
45										
-5										
50										
-10										
55										
-15										
60										

SAMPLE TYPES:

B BULK SAMPLE

C CORE SAMPLE

G GRAB SAMPLE

R RING SAMPLE

S SPLIT SPOON SAMPLE

T TUBE SAMPLE

TYPE OF TESTS:

-200 % FINES PASSING

AL ATTERBERG LIMITS

CN CONSOLIDATION

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RV R VALUE

SA SIEVE ANALYSIS

SE SAND EQUIVALENT

SG SPECIFIC GRAVITY

UC UNCONFINED COMPRESSIVE STRENGTH



Appendix B (Continued)

Previous Explorations

GEOTECHNICAL BORING LOG LB-8

Date 6-13-03

Project Weese Family Trust - Oceanside

Drilling Co. Larive

Hole Diameter 30"

Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100'Drop 12"

Elevation Top of Hole 158'

Location

Sheet 1 of 1

Project No. 040963-001

Type of Rig Bucket Auger

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
	0	N S							Logged By _____ BJO Sampled By _____ BJO	
	155							SM	QUATERNARY TERRACE DEPOSITS (Qt) @ 0'-2': Light orange-brown silty SAND; dry to slightly moist, very dense, fine grained	
	5							SC	@ 2'-3': Brown sandy CLAY, moist, stiff, horizontal profile ring holes; cemented along base	
	150								@ 4': Sample is similar to above; light orange-brown silty SAND, slightly moist, very dense; fine to medium grained	
	10								@ 6': Grain size and moisture increases, becomes orange-brown silty SAND; moist, dense; fine to medium grained; local stringers and pods of gray color	
	145	C:EW, 10N C:EW, 3-8N		R-1	8(11")	126.1	4.1	SM	@ 10': Sample is: Orange-brown silty SAND; moist, dense; medium grained with scattered subangular coarse sand to gravel	
	15							SM	@ 10.5'-11.0': Scattered subrounded gravel and small cobbles supported in matrix similar to above; rare claystone clasts	
	140								TERTIARY SANTIAGO FORMATION (Tsa) @ 11': Light gray silty SANDSTONE; slightly moist, dense; very fine grained; generally massive; rare gray claystone clasts	
	20								@ 12': Contact, iron-oxide stained above, generally clean, light gray color below; parallels the contact above, generally dips 3-8 degrees north	
	135								@ 16': Discontinuous pod of orange sand in west wall, horizontal	
	25								@ 18': End downhole log	
	130			R-2	9	120.7	7.7	SM	@ 20': Sample is: gray silty to clayey SANDSTONE, slightly moist, dense to very dense; fine grained; local, gray claystone clasts up to 1/8"	
	30								Total Depth = 20 Feet Downhole Logged to 18 Feet No ground water encountered at time of drilling Backfilled and tamped with native soil on 6/13/03	

SAMPLE TYPES:

S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

G GRAB SAMPLE
SH SHELBY TUBE

TYPE OF TESTS:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
CN	CONSOLIDATION
CR	CORROSION

SA SIEVE ANALYSIS
CU TRIAXIAL SHEAR
EI EXPANSION INDEX
RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-9

Date 6-13-03 Sheet 1 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100'Drop 12"
 Elevation Top of Hole 170' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By <u>BJO</u> Sampled By <u>BJO</u>	
170	0							SM	<u>QUATERNARY TERRACE DEPOSITS (Q)</u> @ 0': Light orange-brown silty SAND to sandy SILT, dry, very fine grained; weakly cemented	
165	5								@ 7': Generally coarsens with depth, bulk sample (7-9') is fine to medium grained, slightly moist, otherwise same as above	
160	10			R-1	4	117.9	5.8	SM	@ 10': Sample is: orange-brown SAND, slightly moist, medium dense; fine to medium grained	
155	15								@ 14.9': Gradational contact to orange-brown clayey SAND; moist, medium dense	
									@ 16.5': 6" thick horizontal layer of scattered gravel, matrix supported	
									@ 18.5': Base of clayey coarse SAND with gravel, moist, medium dense to loose; horizontal, slightly undulatory contact	
150	20	C:Horizontal S:N70E, 22S		R-2	3	94.3	27.4	CL/ML	<u>TERTIARY SANTIAGO FORMATION (Tsa)</u> @ 18.5': Gray silty CLAYSTONE; slightly moist; medium dense to dense; micaceous; weathered, discontinuous oxidized fractures	
								CL	@ 19.5': Gray CLAY-lined shear, polished, weathered, continuous	
									@ 20': Sample is similar to above	
								SM	@ 23.3': Diffuse contact with light gray SANDSTONE; slightly moist, medium dense; very fine grained	
145	25	C:N60-70E, 2-3N							@ 25': Grain size coarsens to fine grained	
									@ 29.4': 1/4" to 1" thick gray-brown clayey SANDSTONE, locally cemented	
140	30	GB:N50E, 13NW								

SAMPLE TYPES:
 S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:
 DS DIRECT SHEAR
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SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-9

Date 6-13-03 Sheet 2 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 170' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
140	30	N S		R-3	18	114.6	6.8	SM	Logged By <u>BJO</u> Sampled By <u>BJO</u> @ 30': Sample is: Light gray silty SANDSTONE; slightly moist, very dense; very fine grained; micaceous; diffuse iron-oxide staining @ 32'-33.5': Coarsens downward, scattered red claystone rip-up clasts @ 33.5': Irregular, generally north dipping, scoured contact, very fine grained sand below @ 37': Weakly cemented SANDSTONE cementation, increases with depth @ 39': Very minor seepage from above cemented layer, 1.5" thick; continuous around hole @ 40': Sample is: light gray silty SANDSTONE; moist, very dense; fine grained; micaceous @ 41'-42': Yellow-brown CLAYSTONE; moist to wet, soft to medium stiff; clay seam at base, polished, continuous with local seepage @ 42'-42.5': Thinly bedded gray-brown, micaceous SANDSTONE and brown to yellow-brown CLAYSTONE, polished surfaces along bedding surfaces @ 42.5': Gray fine SANDSTONE, moist, dense @ 43.7': Well polished shear zone 4" thick, in yellow-brown CLAYSTONE; oriented along bedding; weathered, slightly moist; striated @ 44': Grades sandy and micaceous @ 46.5'-47.9': Polished red-brown to yellow-brown CLAYSTONE, slightly undulatory, continuous around hole @ 48': Contact with light gray to light blue-gray, silty SANDSTONE, slightly moist; very dense @ 49.5': 4" thick concreted zone, dips northwest, local pink coloration @ 50': Sample is similar to above @ 52': Contact with slightly finer grained material @ 55': Contact with brownish gray clayey SANDSTONE, slightly moist, dense; very fine grained, micaceous; 1/2" thick reddish halo at contact; unsheared @ 59': Gray sandy CLAYSTONE to silty SANDSTONE, slightly	
135	35									
130	40		B:N10E, 14NW B:N15E, 12NW	R-4	20	121.2	10.4	SM SM/CL		
125	45		S:N36E, 27NW STR:15N, N20W B:N50E, 15NW							
120	50			R-5	32	123.1	12.8	SM		
115	55		C:N35W, 14NE							
110	60		GB:N80W, 15N	R-6	40(5")	101.5	11.1	SM/CL		

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
 CN CONSOLIDATION
 CR CORROSION

SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-9

Date 6-13-03

Sheet 3 of 4

Project Weese Family Trust - Oceanside

Project No. 040963-001

Drilling Co. Larive

Type of Rig Bucket Auger

Hole Diameter 30"

Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100'Drop 12"

Elevation Top of Hole 170'

Location

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
110	60	N S						SM/CL	moist, dense; fine grained; concreted gray sandstone/claystone in sample tip	
105	65		GB:N30-50E, 5NW					ML	@ 64': Discontinuous cemented zone; hard, dry @ 65': Light brownish gray clayey SILTSTONE, slightly moist, very stiff; scattered fine SAND grains; grades to sandy SILTSTONE through 68'	
100	70		S:N30-40E, 20NW	R-7	30-10"	116.6	18.4	SM	@ 68': Paper thin, planar shear, local discontinuous shears propagate 1" to 2" above surface @ 70': Sample is: (at top) light grayish brown, clayey to silty SANDSTONE; slightly moist, very dense to hard (and at bottom) light bluish gray, silty SANDSTONE, slightly moist, very dense; all very fine grained @ 71.5': Contact-iron stained, generally fine to medium grained	
95	75		C:N60W, 3-5SW F:N57E, 40SE STR:35SE, N60W						@ 74.5': Clay-lined fault surface, continuous around hole; dry, tight; sense of offset not evident	
90	80		F:N57E, 40SE STR:35SE, N60W	R-8	30-10"	115.3	11.9	SM/SC	@ 77.6': Fault surface lined with 2-3 mm of lavender clay, dry, stiff; striated, locally bifurcated, 1-2" apparent offset down to south @ 80': Sample is: light gray to gray silty to clayey SANDSTONE, slightly moist, very dense; very fine grained; slightly micaceous @ 80.1': East dipping shear offsets brown 1" thick claystone seam, 0.5" down to east	
85	85		F:N28E, 55S B:NS-5-10W						@ 83'-84': Very minor seepage @ 83.9': 4" thick concretion of gray-brown clayey SAND; continuous around hole @ 85': Grades to moist (darker gray) medium grained SAND, scattered light gray and orange concrete nodules	
80	90			R-9	30-8"	114.8	14.8	SM	@ 90': Sample is: gray SANDSTONE; moist, very dense, fine to medium grained	

SAMPLE TYPES:

S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

G GRAB SAMPLE
SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
MD MAXIMUM DENSITY
CN CONSOLIDATION
CR CORROSION

SA SIEVE ANALYSIS
CU TRIAXIAL SHEAR
EI EXPANSION INDEX
RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-9

Date 6-13-03 Sheet 4 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 170' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
80	90	N S							Logged By <u>BJO</u> Sampled By <u>BJO</u>	
									Total Depth = 90 Feet Downhole Logged to 87 Feet Very minor seepage from north wall at 39 feet and generally continuous at around hole at 83-84 feet Standing water at 83.5 Feet depth on a.m. of 6/16/03 Backfilled and tamped with native and bentonite on 6/17/03	
75	95									
70	100									
65	105									
60	110									
55	115									
50	120									

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
 CN CONSOLIDATION
 CR CORROSION

SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-10

Date 6-16-03 Sheet 1 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 185' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Logged By <u>BJO/RKW</u> Sampled By <u>BJO</u>	Type of Tests
185	0	N S						SM	<u>QUATERNARY TERRACE DEPOSITS (Q)</u> @ 5': Orange-brown silty to clayey SAND; slightly moist, medium dense; generally fine grained, very weakly cemented	
180	5								@ 5'-6': Subvertical light brown SAND infilled vein	
175	10			R-1	6	125.3	9.6	SM	@ 10': Sample is same as above	
170	15							SM	@ 14.8-17': Grades to medium grained, scattered coarse grains; generally clayey SAND, moist, medium dense, rare subangular gravel, micaceous	
165	20			R-2	5	103.2	7.7	SM	@ 18.5': 1-3" thick silty fine SAND bed, yellow-brown to orange-brown; moist, medium dense, horizontal; friable; continuous around hole @ 20': Sample is: yellow-brown to orange-brown, silty SAND, slightly moist, medium dense; friable; black mottled pattern to sample top @ 20.8': Contact with 1' thick fine silty SAND, similar to 18.5'; undulatory, horizontal top; gradational bottom; micaceous; friable	
160	25								@ 24': Subrounded cobbles and subangular gravel in 5" thick horizontal layer; matrix supported @ 24.5': Low angle cross-bedding of gold mica-rich laminations and thin beds @ 27.2': Horizontal bed of medium to coarse grained SAND; 4-6" thick	
155	30							SM	<u>TERTIARY SANTIAGO FORMATION (Tsa)</u> @ 28.7': Light gray to yellow-gray SANDSTONE; slightly moist,	

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
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SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-10

Date 6-16-03 Sheet 2 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 185' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By <u>BJO/RKW</u> Sampled By <u>BJO</u>	
155	30			R-3	16	94.3	20.4	ML	dense; very fine grained; minor silt; undulatory but sharp upper contact; generally horizontal @ 30': Sample is: Light gray sandy SILTSTONE; slightly moist, medium dense to dense; very fine grained; orange oxidation stain to upper sample @ 30.5': Generalized bedding based on 4" thick yellow-gray sand band, local claystone rip-ups @ 32.5': Very diffuse, north dipping contact, fine to medium grained below @ 35.5': Generally north dipping iron-stained bands, diffuse	
150	35									
145	40									
140	45			R-4	10	104.0	22.7	ML-CL ML/CL	@ 41': Sand grades medium to coarse grained @ 41.5': Contact slightly undulatory, drops 4" to southwest across hole, unshared; stiff material below @ 42': Sample is gray sandy SILTSTONE to silty CLAYSTONE, slightly moist, very stiff; massive @ 43'-45': Local concreted and weathered pods, otherwise very stiff to very stiff and massive @ 45': Rare subvertical, discontinuous, tight, unweathered, short joints @ 45.4'-45.7": Contact, cemented, gray, very fine SAND below, slightly moist, very dense @ 47': 3" thick light brown, concrete SILTSTONE bed; dry to slightly moist, hard; fractured; slightly undulatory; drops 4" to northwest across hole, sand above clayey below	
135	50			R-5A R-5B	9	110.0 120.2	18.8 9.5	SC-CL SM	@ 50': Sample is: light gray-brown clayey SILTSTONE to silty CLAYSTONE, slightly moist, very stiff; minor very fine SAND, polished surfaces in sampler tip @ 51.5': Thin, irregular shear zone enters hole, discontinuous, not well developed; short semi-polished surfaces @ 53': Contact, thin red clay bands within blue-gray SANDSTONE, moist, dense; local concretion, grades to light brownish gray to light gray SANDSTONE, moist, medium dense to dense; fine to medium grained, minor silt @ 54.1'-54.5': Tight, stiff, sharp CLAYSTONE bed; faintly polished, sharp upper surface	
130	55							SM		
125	60									

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
 CN CONSOLIDATION
 CR CORROSION

SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-10

Date 6-16-03

Sheet 3 of 4

Project Weese Family Trust - Oceanside

Project No. 040963-001

Drilling Co. Larive

Type of Rig Bucket Auger

Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100'Drop 12"

Elevation Top of Hole 185' Location

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
125	60	N S							Logged By BJO/RKW Sampled By BJO	
120	65	C:N50E, 8NW		R-6	28	106.3	20.6	ML	@ 62': Oblong CLAYSTONE rip-up clasts	
								CL	@ 62.5'-63': Blue-gray SAND lenses	
									@ 63': Generally gray-brown clayey SILTSTONE; slightly moist; very stiff; micaceous, thin (1/8") laminations of pink-gray yellow-brown CLAYSTONE, slightly moist, very stiff, micaceous discontinuous, very short parting surfaces along approximate bedding (contact orientation)	
		C:N60-70E, 9NW						SM	@ 66': Contact; concretion lined; 1" thick planar brown, CLAYSTONE with planar parting surfaces above; slightly moist, soft to medium stiff	
									@ 67': Light blue-gray to light gray SANDSTONE, slightly moist, dense; fine to medium grained; micaceous	
115	70	GB:N60E, 10NW							@ 70': Diffuse contact, gray medium grained below, generalized attitude on red clayey SAND ribbon, dips 0.5' to the northwest	
									@ 72': Minor seepage, sand is very moist to wet to 78'	
110	75									
105	80	S:N48E, 7NW						CL/CH	@ 78.5': Contact with brown CLAYSTONE, moist to wet along short fractures; soft to stiff; abundant discontinuous shears, continuous around hole	
									@ 79'-79.5': Well-developed shear zone, 0.5' thick, attitude on planar lower surface; local concreted nodules to 6" diameter; shears dry up and decrease through 80.5'; possible striae trend N05W	
		S:N51E, 8NW						SM	@ 81.3': Contact with blue-gray SANDSTONE interbed, moist, dense to very dense	
								CL	@ 81.7': Lower shear, immediately above SANDSTONE; continuous, 1" to 2" thick zone	
									@ 82.5'-83.8': Brown CLAYSTONE bed; parallel to above; very moist, soft to stiff; sheared base and top; scattered gold mica; red clayey sand ribbon at base	
100	85							SM	@ 84': Blue-gray SANDSTONE, wet, dense to very dense, weeping seepage continues	
								CL	@ 87': Brown CLAYSTONE, slightly moist, stiff; end downhole log	
95	90									

SAMPLE TYPES:

S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

G GRAB SAMPLE
SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
MD MAXIMUM DENSITY
CN CONSOLIDATION
CR CORROSION

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EI EXPANSION INDEX
RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-10

Date 6-16-03 Sheet 4 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 185' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
95	90	N S							Logged By <u>BJO/RKW</u> Sampled By <u>BJO</u>	
				R-7	30(10")	116.1	14.3	SM	@ 92': Sample is: Gray silty SANDSTONE, slightly moist, dense to very dense; micaceous; fine grained Total Depth = 92 Feet Downhole logged to 87 feet Minor seepage at 72 feet to total depth Standing water at 91 feet Backfilled and tamped with native and bentonite on 6/16/03	
90	95									
85	100									
80	105									
75	110									
70	115									
65	120									

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
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 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-11

Date 6-18-03 Sheet 1 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 170' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By <u>BJO</u> Sampled By <u>BJO</u>	
170	0							SM/ML	<u>QUATERNARY TERRACE DEPOSITS (Q_t)</u> @ 0': Reworked, topsoil-like material consisting of light brown SAND, to clayey SILT, slightly moist, loose to medium stiff; irregular lower contact	
		Casing						SM/SC	@ 2.5'-9': Orange-brown silty SAND; moist, medium dense, friable, medium grained; minor clay; fine to medium grained micaceous	
165	5								@ 5.5': Scattered very coarse SAND to subangular gravel in coarse silt, sand matrix	
									@ 9': Horizontal, slightly undulatory contact with orange-brown to silty SAND, moist, dense, very fine grained; not offset by joint at 9.5'; cemented infilling, propagates to 10'	
160	10	J:N62E, 74N		R-1	8	116.2	15.0	SM/SC	<u>TERTIARY SANTIAGO FORMATION (T_{sa})</u> @ 10'-13': Light gray to gray silty to clayey SANDSTONE, moist, dense; very fine grained; rare subvertical fractures filled with up to 1/8" thick orange sandy silt; undulatory upper contact, scoured to the southwest	
		C:25-35E 35NW							@ 13': Gradational contact: Light yellow-gray silty SANDSTONE, slightly moist, dense; scattered black stained blebs and subvertical streaks; fine to medium grained	
155	15							CL	@ 16': Contact with gray-brown silty CLAYSTONE, moist, medium stiff; orange stained above, weathered below for 1-2"; stiff to very stiff through 21', with scattered concreted nodules	
		C:20-40E 8-10NW							@ 21': Scattered white concretions ring hole, local loose pockets due to subhorizontal shear zone; 2-3" above contact, discontinuous polished surfaces	
150	20							SM	@ 21.2': Contact with silty to clayey SANDSTONE; moist, dense, blue-gray, with red clayey ribbons at contact, fine grained	
		S:EW-12N								
		C:N30E 10NW								
145	25								- coarsens from fine to medium grained through 29'	
140	30									

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
 CN CONSOLIDATION
 CR CORROSION

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 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-11

Date 6-18-03 Sheet 2 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 170' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By <u>BJO</u> Sampled By <u>BJO</u>	
140	30			R-2	15	114.1	6.3	SM	@ 30': Sample is: Light gray SANDSTONE; slightly moist, medium dense; minor silt; generally fine grained; diffuse orange staining; friable @ 32': 1" to 6" thick layer of red to brown clay and concretions, continuous around hole, pinches and swells, no clear orientation @ 34.1'-35': Concreted SILTSTONE continuous around hole; undulatory, with discontinuous red-orange clayey ribbons at base; local blueish SAND below	
135	35									
130	40									
125	45	C:EW-5N S:NS 5-10W		R-3	20(11")	112.0	18.1	SC	- SANDSTONE continues, generally massive light gray, fine to medium grained, moist though 44' @ 44': Gray-brown clayey SILTSTONE; slightly moist, very stiff; discontinuous but planar, poorly developed shear surfaces in upper 3" below contact @ 46': Sample is similar to above, with fine SAND	
120	50							SM	@ 50': Grades to very fine grained silty SANDSTONE, slightly moist, dense to very dense, scattered red-brown claystone, caliche (?) pockets, and cemented siltstone clasts through 55'	
115	55							CL	@ 55'-57': Grades fine to medium grained red-brown CLAYSTONE @ 57': Generalized bedding on thin, nearly continuous red sandy clay lamination	
110	60	GB:N30-40W 3-5NE								

SAMPLE TYPES:
 S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:
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 MD MAXIMUM DENSITY
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SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-11

Date 6-18-03 Sheet 3 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 170' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By <u>BJO</u> Sampled By <u>BJO</u>	
110	60			R-4	30(10")	103.2	11.5	SM	@ 60': Minor seepage through 63' @ 60': Sample is: Light brownish gray SANDSTONE; moist, very dense @ 63': 1' thick concreted gray-brown SILTSTONE bed, intact unshaped; wet above; clear upper contact, iron stained	
105	65		B:N-45E, 16NW							
100	70		B:N4E, SW 5W	R-5	30(10")	120.0	13.2	SM	@ 68': 4 to 6" thick, semi-continuous light brown concreted SILTSTONE/CLAYSTONE, local pink coloration @ 69': Gray-brown CLAYSTONE bed, similar to above @ 70': Sample is: Light blue-gray SANDSTONE; slightly moist, very dense; fine grained with minor silt	
95	75									
90	80		C:N20-40E	R-6	30(11")	112.3	19.0	CL	@ 78': Northwest dipping contact, dips 6" across hole, unshaped, minor seepage from blue-gray sandstone above @ 78.5': Brownish gray silty CLAYSTONE, slightly moist, very stiff to hard; generally homogeneous and massive, with scattered gravel-sized concreted nodules @ 80': Sample is similar to above	
85	85							SC	@ 84': Blue-gray SANDSTONE bed; very stiff to hard material, interbedded blue-gray clayey SANDSTONES, dry to slightly moist, very dense to hard; locally cemented; and brown clayey SILTSTONES, dry to slightly moist, very stiff	
80	90			R-7	25(10")	114.8	16.1	SC	@ 90': Sample is: Gray clayey SANDSTONE, slightly moist, very stiff; finely micaceous; sand is very fine grained	

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
 CN CONSOLIDATION
 CR CORROSION

SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-11

Date 6-18-03 Sheet 4 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 170' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
80	90	N S							Logged By <u>BJO</u> Sampled By <u>BJO</u>	
									Total Depth = 90 Feet Downhole Logged to 88 Feet Minor seepage at 60 to 63 feet and at 78 feet Backfilled and tamped with native and bentonite on 6/18/03	
75	95									
70	100									
65	105									
60	110									
55	115									
50	120									

SAMPLE TYPES:

S SPLIT SPOON

R RING SAMPLE

B BULK SAMPLE

T TUBE SAMPLE

TYPE OF TESTS:

DS DIRECT SHEAR

MD MAXIMUM DENSITY

CN CONSOLIDATION

CR CORROSION

SA SIEVE ANALYSIS

CU TRIAXIAL SHEAR

EI EXPANSION INDEX

RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-12

Date 6-19-03 Sheet 1 of 2
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 187' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By <u>BJO</u> Sampled By <u>BJO</u>	
185	0							SM	QUATERNARY TERRACE DEPOSITS (Q _t) @ 0': Orange-brown sandy SILT and silty SAND, dry to slightly moist, medium dense; fine to locally medium grained	
180	5								@ 5': 1/2" diameter, solitary, root @ 5-14': Subvertical sand filled veins, narrow and pinch out with depth; infilling is light brown, friable, fine- to medium-grained SAND; locally roots along plane	
175	10			R-1	9	117.7	9.4	SM	@ 10': Sample is: Orange-brown silty SAND; slightly moist, dense; fine to medium grained	
170	15		C:Horizontal						- grades to medium grained through 14' @ 15': Contact with fine-grained material	
165	20		J:N5E, 90	R-2	11	111.3	8.5	SM	@ 19-20': Scattered coarse to very coarse grains, rare fine gravel; root-lined joint, no offset @ 20': Sample similar to above @ 20'-23': Thin, generally horizontal beds of fine grained silty and coarse grained material; rare subangular gravel	
160	25		C:N50-70W, 5-15NE					SM ML SM	TERTIARY SANTIAGO FORMATION (T _{sa}) @ 23.2': Horizontal contact with light orange-gray silty SANDSTONE, slightly moist, dense; fine grained, friable; abundant threads of black mottling though 24 @ 24.5': Gray-brown clayey SILTSTONE; slightly moist; soft to medium stiff; weathered; abundant dark brown mottling irregular, northwest dipping contact @ 25.5': Contact with light gray to white SANDSTONE, dry, dense; fine to very fine grained; minor stiff @ 27'-28': Bands of colored stains ring hole, generally horizontal brown, yellow, red-gray silty to clayey SANDSTONE	
155	30									

SAMPLE TYPES:
 S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
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SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-12

Date 6-19-03

Sheet 2 of 2

Project Weese Family Trust - Oceanside

Project No. 040963-001

Drilling Co. Larive

Type of Rig Bucket Auger

Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100'Drop 12"

Elevation Top of Hole 187' Location

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By BJO Sampled By BJO	
155	30		C:5-15W, 7SW	R-3	12	111.1	5.2	SM	@ 31': Sample is: Light yellow-gray SANDSTONE; dry to slightly moist, dense; fine grained with minor silt; friable; coarsens downward through 32' @ 32'-38': Gray-brown silty CLAYSTONE to fine sandy SILTSTONE; slightly moist, very stiff; very finely micaceous and siltier with depth	
150	35							CL	@ 35': Irregular cemented yellow-brown CLAYSTONE; continuous around hole @ 35'-37': Scattered cemented nodules	
145	40		S:N62E, 24NW B:N69E, 18NW	R-4	20(11")	122.3	10.5	SM	@ 39': Yellow-brown CLAYSTONE bed; discontinuous but planar polished surfaces, very minor discontinuous shears along; upper contact @ 40.5': Light blue-gray silty SANDSTONE; slightly moist, very dense; very fine grained	
140	45			R-5	20(11")	120.7	11.5	SM	@ 43.5': Semi-continuous, reddish clayey sandy SILTSTONE layer, 1" thick @ 44': Concreted SANDSTONE, 3-4" thick, discontinuous @ 46': Sample is: Gray to light gray silty SANDSTONE; slightly moist; very dense; very fine grained; friable to weakly cemented Total Depth = 46 Feet Downhole logged to 44 feet No ground water encountered at time of drilling Backfilled and tamped with native and bentonite on 6/19/03	
135	50									
130	55									
125	60									

SAMPLE TYPES:

S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

G GRAB SAMPLE
SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
MD MAXIMUM DENSITY
CN CONSOLIDATION
CR CORROSION

SA SIEVE ANALYSIS
CU TRIAXIAL SHEAR
EI EXPANSION INDEX
RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-13

Date 6-23-03

Sheet 1 of 4

Project Weese Family Trust - Oceanside

Project No. 040963-001

Drilling Co. Larive

Type of Rig Bucket Auger

Hole Diameter 30"

Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100'Drop 12"

Elevation Top of Hole 172'

Location

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By BJO Sampled By BJO	
170	0								<u>QUATERNARY TERRACE DEPOSITS (Q_t)</u> @ 0-2': Light brown sandy SILT; dry, loose; very friable; scattered roots through 3' @ 2'-6.5': Orange-brown silty SAND; dry to slightly moist, dense, generally fine grained; weakly cemented	
165	5							SM	- scattered subrounded gravel along basal contact <u>TERTIARY SANTIAGO FORMATION (T_{sa})</u> @ 6.5': Very light gray to light orange-gray silty SANDSTONE, dry, medium dense; friable to locally cemented; generally coarsens downward, fine to medium grained through 11' @ 8': Generalized bedding along medium grained SAND layer 1/2-1" thick	
160	10		C:Horizontal GB:N5-8E, 10-15NW J:N70E, 90	R-1	7	111.6	9.6	SM CL/ML	@ 10': Sample is: Light orange-gray to yellow-gray silty SANDSTONE; slightly moist; medium dense to dense; fine grained; weakly cemented; light red-orange stained joint surfaces @ 11': Scoured, irregular, but generally northwest dipping contact with gray-brown SILTSTONE to CLAYSTONE; slightly moist, stiff; weathered; abundant dark brown and black streaks/staining; stiffens/less fractured through 14 feet	
155	15		JN83E, 77S							
150	20		C:N20-50E, 7-8NW S:N10E, 20-35W J:N41W, 72NE	R-2	8(10")	121.9	9.2	SM	@ 17'-17.5': Generally northwest dipping concreted CLAYSTONE, 4"-6" thick, generalized contact @ 18.5': Discontinuous shear, steepens and dies out to the north @ 19.5': Short, tight, brown/root-lined joint @ 20': Grades to blue-gray silty SANDSTONE, slightly moist, dense to very dense; very fine grained; local northwest dipping, disc. red-orange band below contact	
145	25		GB:N20-30E, 5-7NW							
140	30									

SAMPLE TYPES:

S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

G GRAB SAMPLE
SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
MD MAXIMUM DENSITY
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SA SIEVE ANALYSIS
CU TRIAXIAL SHEAR
EI EXPANSION INDEX
RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-13

Date 6-23-03

Sheet 2 of 4

Project Weese Family Trust - Oceanside

Project No. 040963-001

Drilling Co. Larive

Type of Rig Bucket Auger

Hole Diameter 30"

Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100'Drop 12"

Elevation Top of Hole 172'

Location

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By BJO Sampled By BJO	
140	30			R-3	20(7")	119.2	4.4	SM	@ 30': Sample is: Generally similar to above; cemented in sampler tip, with local white powder (caliche?) @ 30.5'-31.5': Irregular, concretion, generally 1" thick, orange stained medium grained SANDSTONE above, clayey SILTSTONE below @ 30.5-36.5': Weakly to moderately cemented light gray, sandy SILTSTONE to silty SANDSTONE, dry, very dense/stiff to hard	
135	35		GB:N35E, 8NW					ML	@ 37': Gradational contact with gray-brown to gray sandy to clayey SILTSTONE, slightly moist, very stiff; micaceous @ 38.1'-40': Micaceous sandy laminations, clearly traceable around hole, dips to the northwest	
130	40			R-4	20	126.2	6.8	SM	@ 40': Light gray SANDSTONE; slightly moist, dense to very dense; fine grained, grades to medium with scattered coarse and very coarse grains through 41'; moist material at 41-43', scattered claystone rip-ups	
	45							CL	@ 41.2'-43.3': Very irregular, extremely scoured contact with brown; very stiff to hard; clayey SILTSTONE to silty CLAYSTONE at top, slightly moist, blue-gray SANDSTONE to SILTSTONE, slightly moist, dense; very fine grained; local red-brown staining	
125	50		C:N20-40E, 10NW	R-5	21	112.7	16.3	ML SM	@ 46': Sample is similar to above @ 47': Contact with light gray silty SANDSTONE, slightly moist, dense; very fine grained; generally friable; very minor, very discontinuous yellow-brown CLAYSTONE laminations along upper contact @ 49': Lenticular concreted SILTSTONE; fractured, with local pink coloration	
120	55								@ 57'-58': Concretion nodule; sand is fine to medium grained below @ 59.5': Dark red to orange, moist, medium grained SAND along contact	
115	60									

SAMPLE TYPES:

S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

G GRAB SAMPLE
SH SHELBY TUBE

TYPE OF TESTS:

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SA SIEVE ANALYSIS
CU TRIAXIAL SHEAR
EI EXPANSION INDEX
RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-13

Date 6-23-03 Sheet 3 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100'Drop 12"
 Elevation Top of Hole 172' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By <u>BJO</u> Sampled By <u>BJO</u>	
60									@ 60': Cemented contact, undulatory, gently west dipping	
110				R-6	30(11")	120.5	14.0	SM	@ 61': Sample is: Light gray silty SANDSTONE; slightly moist, very dense; very fine grained to fine grained; micaceous; diffuse blue-gray interbeds @ 62.5': Thin red-orange-lined contact, micaceous laminations in gray sandy SILTSTONE to silty SANDSTONE through 63'	
65									@ 65': Grades to SANDSTONE, gray to light blue-gray, moist, very dense; very weak weeping seepage at 68' to 77'	
105									@ 68.3': Thin brown clayey SILT lamination, planar; unpolished; continuous; local concretions, weak weeping seepage continues	
70			B:N15E, 7-8NW	R-7	27	121.4	13.1	SM	@ 70': Sample is: Light gray SANDSTONE; moist, very dense; fine grained with minor silt and medium grained material; friable	
100									@ 76'-78': Scattered CLAYSTONE rip-ups	
75									@ 77.7'-78': Slightly undulatory, cemented, unsheared contact, local red staining; below is brownish-gray SILTSTONE, slightly moist, very stiff	
95								CL/ML	@ 78.2'-78.6': Upper, planar contact with 3-4" thick shear zone, local; yellow-brown concreted CLAYSTONE rolled into silt and clay; moist, soft to locally stiff	
80			S:N54E, 6NW S:N18W, 5SW S:N36E, 4NW	R-8	28	109.8	20.2	CL	@ 78.9': Zone exists hole, planar lower contact @ 80': Sample is: Brownish gray to brown silty CLAYSTONE; slightly moist, very stiff @ 81'-82': Scattered cemented nodules	
90									@ 87': Grades to gray sandy SILTSTONE, slightly moist, very stiff; scattered very fine SAND and mica	
85								ML		
85										
90										

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
 CN CONSOLIDATION
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SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-13

Date 6-23-03 Sheet 4 of 4
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 172' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
									Logged By <u>BJO</u> Sampled By <u>BJO</u>	
90				R-9	25(10")	120.3	12.5	ML/SM	@ 89.5'-90': White and red-orange and blue-gray bands ring hole, very shallow northwest dip @ 90': Sample is: Gray sandy SILTSTONE to silty SANDSTONE, slightly moist, very stiff/very dense; very fine grained; weak to moderate cementation; finely micaceous - very minor seepage at 94-97'	
80										
95										
75										
100				R-10B R-10A	24	107.2 113.2	20.7 19.0	CL-ML SM	@ 97.6': Contact: yellow-brown CLAYSTONE laminations along surface, continuous around hole @ 100': Sample is: Light brownish gray silty CLAYSTONE to clayey SILTSTONE, dry to slightly moist, very stiff; scattered very fine SAND, including mica @ 101': Light gray SANDSTONE, dry to slightly moist, very dense; generally fine grained, friable with local concreted pockets; massive	
70			C:N80E, 3-4N							
105										
65										
110				R-11	25(10")	119.2	5.4	SM	@ 110': Sample is similar to above @ 112': Generalized attitude on medium grained diffuse, sand lamination @ 114': End downhole log - similar to total depth	
60			GB:N70-80E, 3-5N							
115										
55									Total Depth = 117 Feet Downhole logged to 114 feet Light weeping seepage at 55 to 77 feet and 94 to 97 feet Backfilled and tamped with native and bentonite on 6/24/03	
120										

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
 CN CONSOLIDATION
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SA SIEVE ANALYSIS
 CU TRIAXIAL SHEAR
 EI EXPANSION INDEX
 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG LB-14

Date 6-25-03 Sheet 1 of 1
 Project Weese Family Trust - Oceanside Project No. 040963-001
 Drilling Co. Larive Type of Rig Bucket Auger
 Hole Diameter 30" Drive Weight 3500#@0-28'; 2500#@28-55'; 1300#@55-85'; 1800#@85-100' Drop 12"
 Elevation Top of Hole 65' Location _____

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
		N S							Logged By <u>BJO/RKW</u> Sampled By <u>BJO</u>	
65	0							CL	QUATERNARY LANDSLIDE DEPOSITS (Qls) @ 0-6': Topsoil consisting of brown silty generally subvertical CLAY; moist, medium stiff; scattered sand and very fine gravel; caliche threads; roots in upper 12"	
60	5			R-1	2	107.3	19.6	CL	@ 5': Sample is: similar to above @ 6.5'-8': Gradational moderately northwest dipping contact with lighter color, sandier material @ 7'-16.5': Generally disturbed beds, pockets, and packages of light brown sandy to silty CLAY, moist, soft, and light gray to light gray-brown, clayey to silty SAND, moist, loose to medium dense; rare dark brown pods of soil-like silty clay (krotovina?)	
55	10			R-2	1	105.9	17.9	CL/SC	@ 10': Sample is: Light brown sandy silty CLAY; moist, soft to medium stiff; darker brown laminations, possible remnant bedding, dips 40-50 degrees; local caliche threads and pockets; mottled coloration @ 13.7': Undulatory, subhorizontal with contact with 2-8" thick layer of dark brown silty CLAY, moist, soft; local shearing within light brown, clay above, very soft material above and below	
50	15	S:N73E, 33N						SM	@ 16.5'-18': Contact, irregular and gradational with light gray-brown silty SAND, moist, loose; fine grained; massive; loose material continues to total depth @ 20': Sample is: Light gray-brown to light gray SAND, moist, loose to locally medium dense; friable	
45	20	C:N70-80E, 30-35S		R-3	2	114.0	12.1	SM	Total Depth = 20 Feet Downhole logged to 18 feet No ground water encountered at time of drilling Backfilled and tamped with native soil on 6/25/03	
40	25									
35	30									

SAMPLE TYPES:

S SPLIT SPOON
 R RING SAMPLE
 B BULK SAMPLE
 T TUBE SAMPLE

G GRAB SAMPLE
 SH SHELBY TUBE

TYPE OF TESTS:

DS DIRECT SHEAR
 MD MAXIMUM DENSITY
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 RV R-VALUE



LEIGHTON AND ASSOCIATES, INC.

Appendix B (continued)

CPT-1 through CPT-7

Cone Penetration Test Soundings

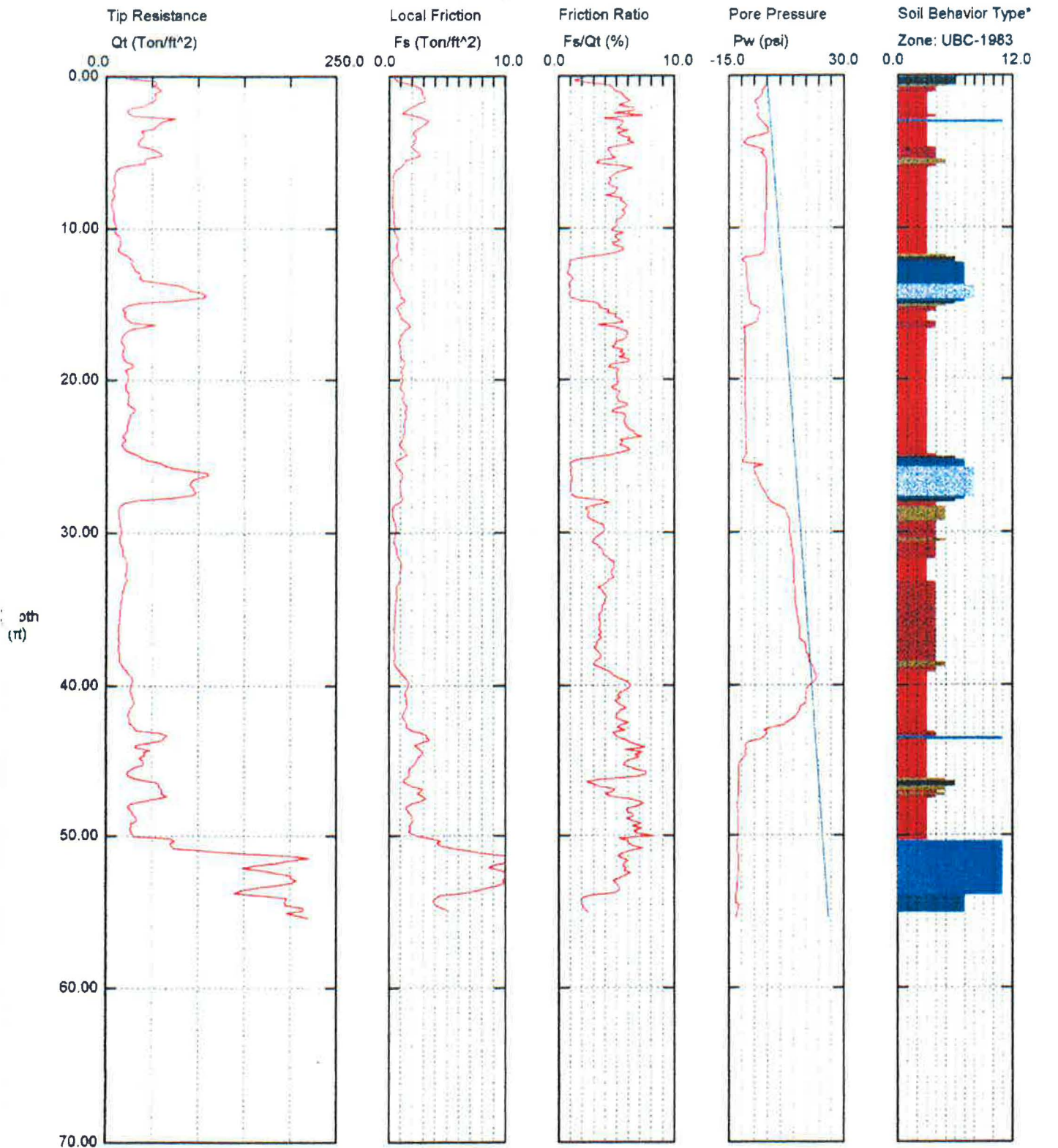
From:

Current Investigation

WEST HAZMAT DRILLING CORP.

Operator: B. BUCKNAM
Sounding: CPT199
Cone Used: 510

CPT Date/Time: 08-04-03 08:01
Location: CPT-01
Job Number: WEESE



Maximum Depth = 55.45 feet

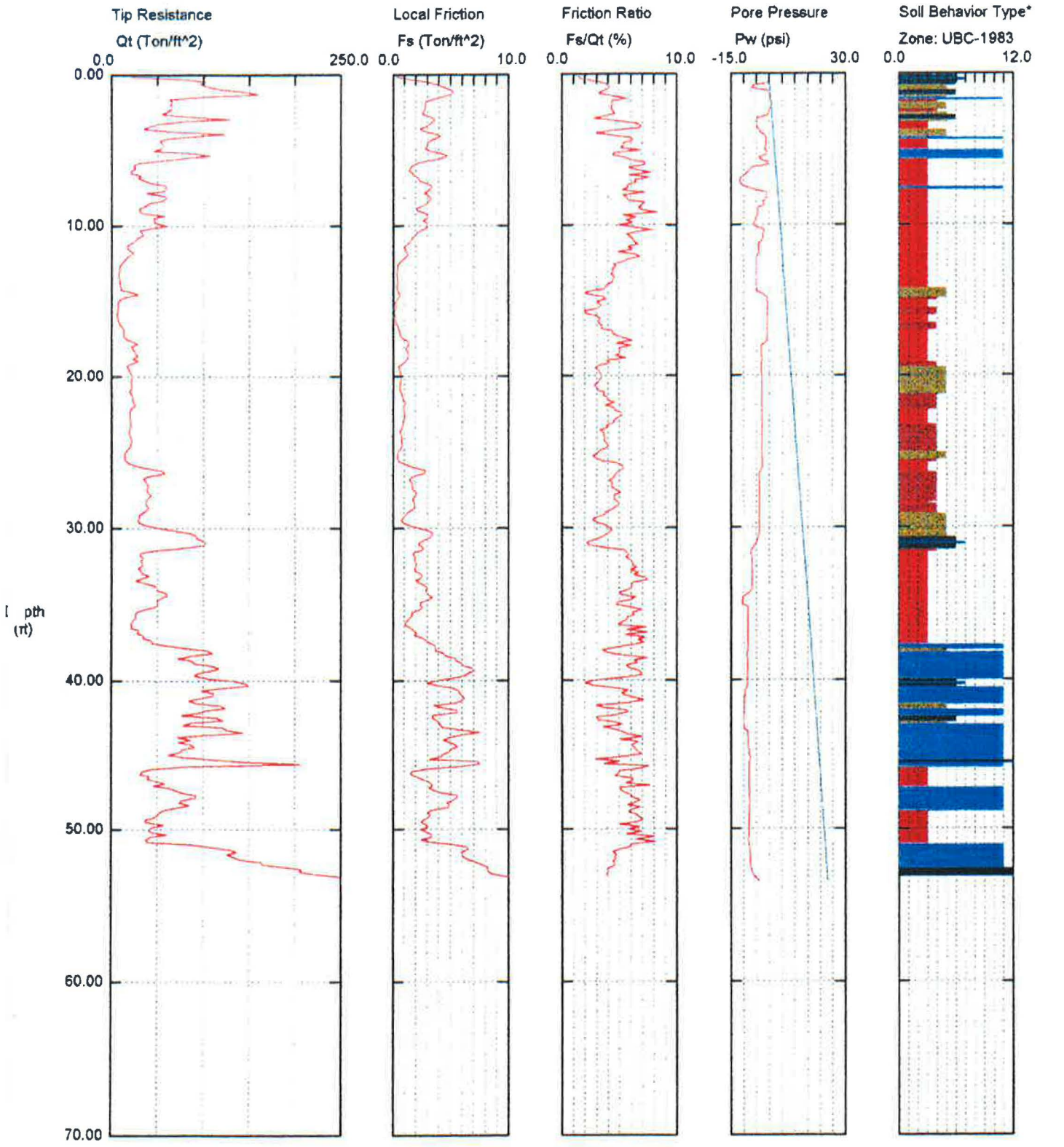
Depth Increment = 0.16 feet

- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

WEST HAZMAT DRILLING CORP.

Operator: B. BUCKNAM
Sounding: CPT200
Cone Used: 510

CPT Date/Time: 08-04-03 09:03
Location: CPT-02
Job Number: WEESE



Maximum Depth = 53.48 feet

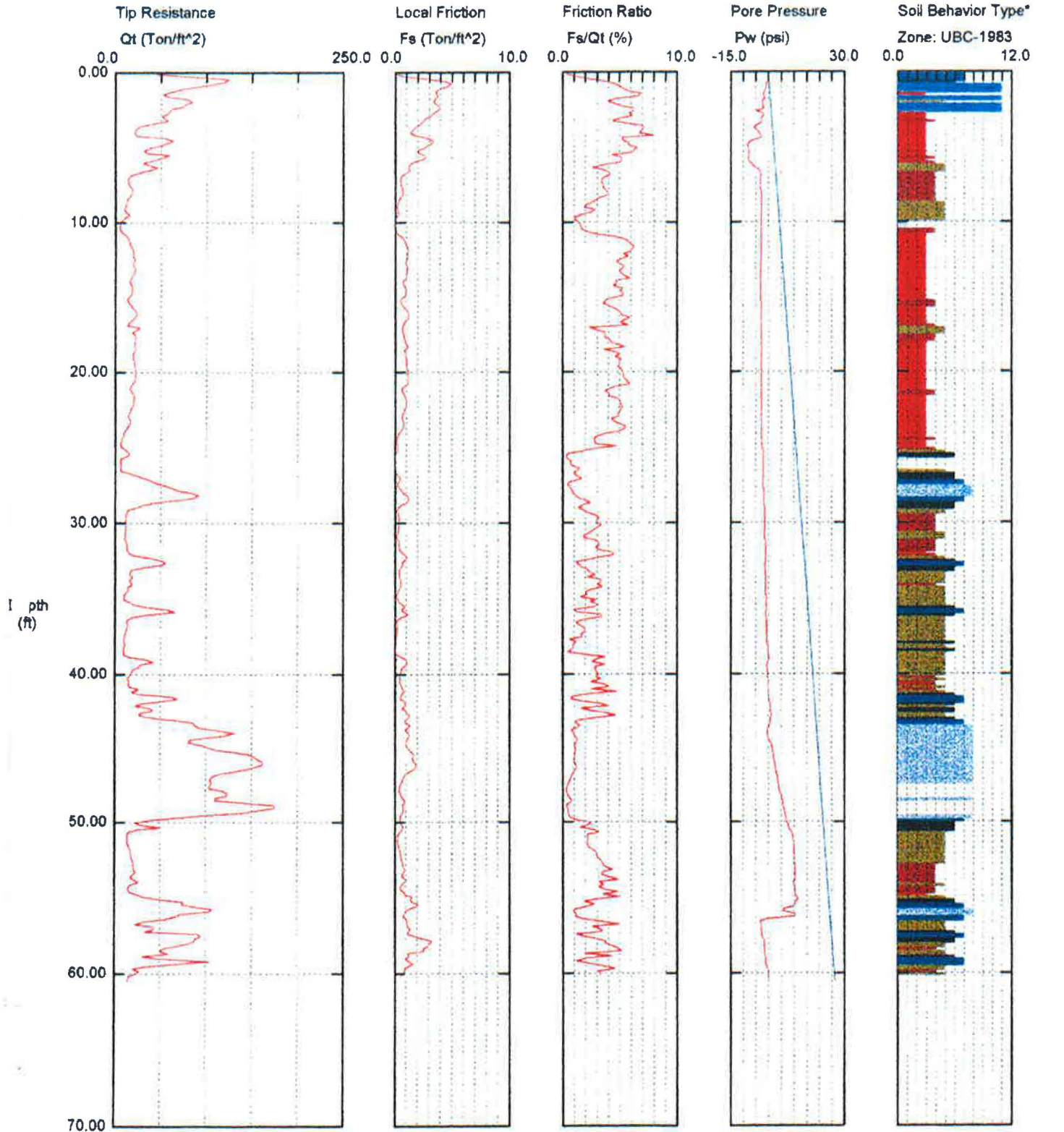
Depth Increment = 0.16 feet

- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

WEST HAZMAT DRILLING CORP.

Operator: B. BUCKNAM
Sounding: CPT201
Cone Used: 510

CPT Date/Time: 08-04-03 10:02
Location: CPT-03
Job Number: WEESE



1 sensitive fine grained
2 organic material
3 clay

4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt

7 silty sand to sandy silt
8 sand to silty sand
9 sand

10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

WEST HAZMAT DRILLING CORP.

Operator: B. BUCKNAM

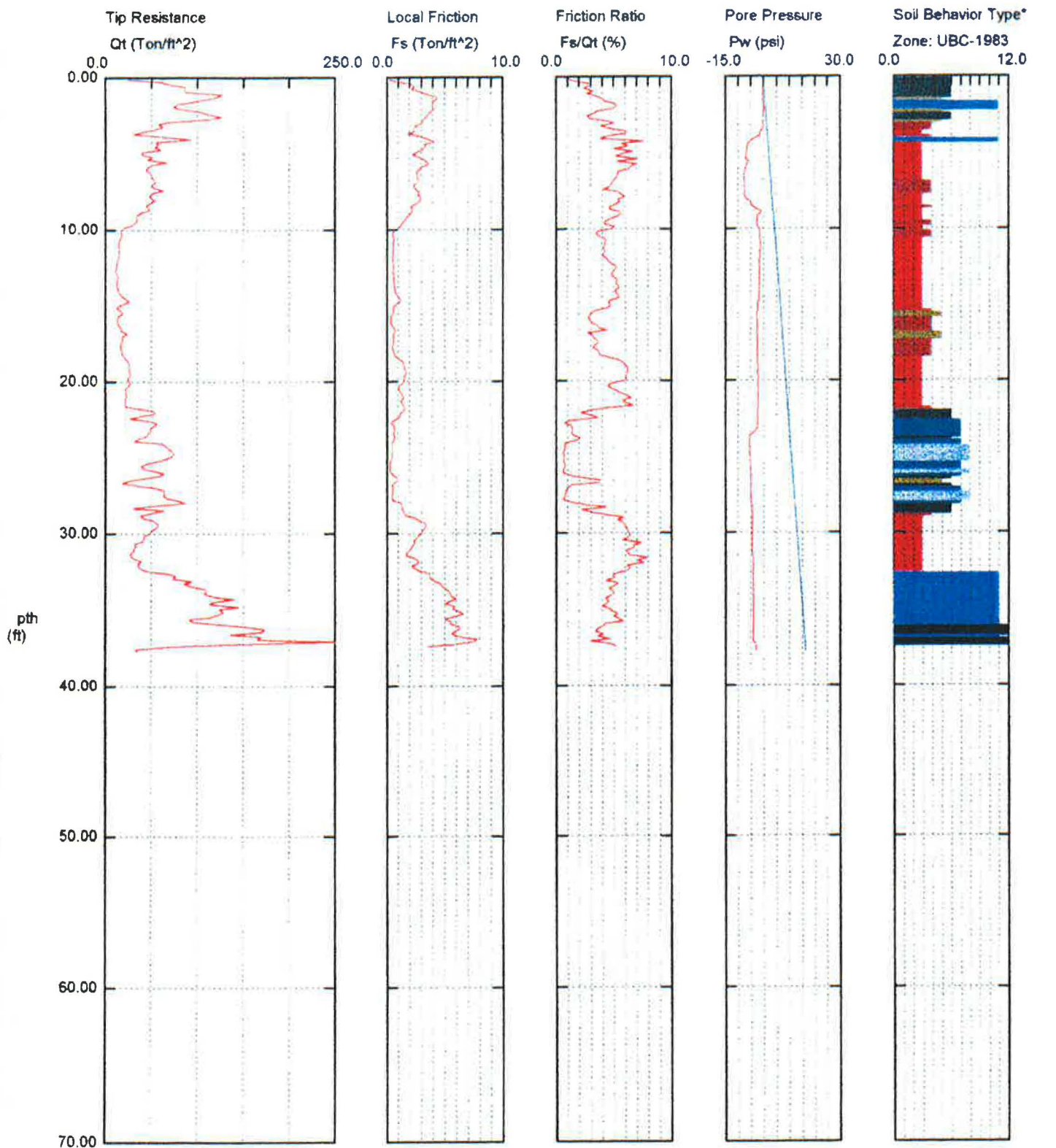
Sounding: CPT202

Cone Used: 510

CPT Date/Time: 08-04-03 11:28

Location: CPT-04

Job Number: WEESE



Maximum Depth = 37.73 feet

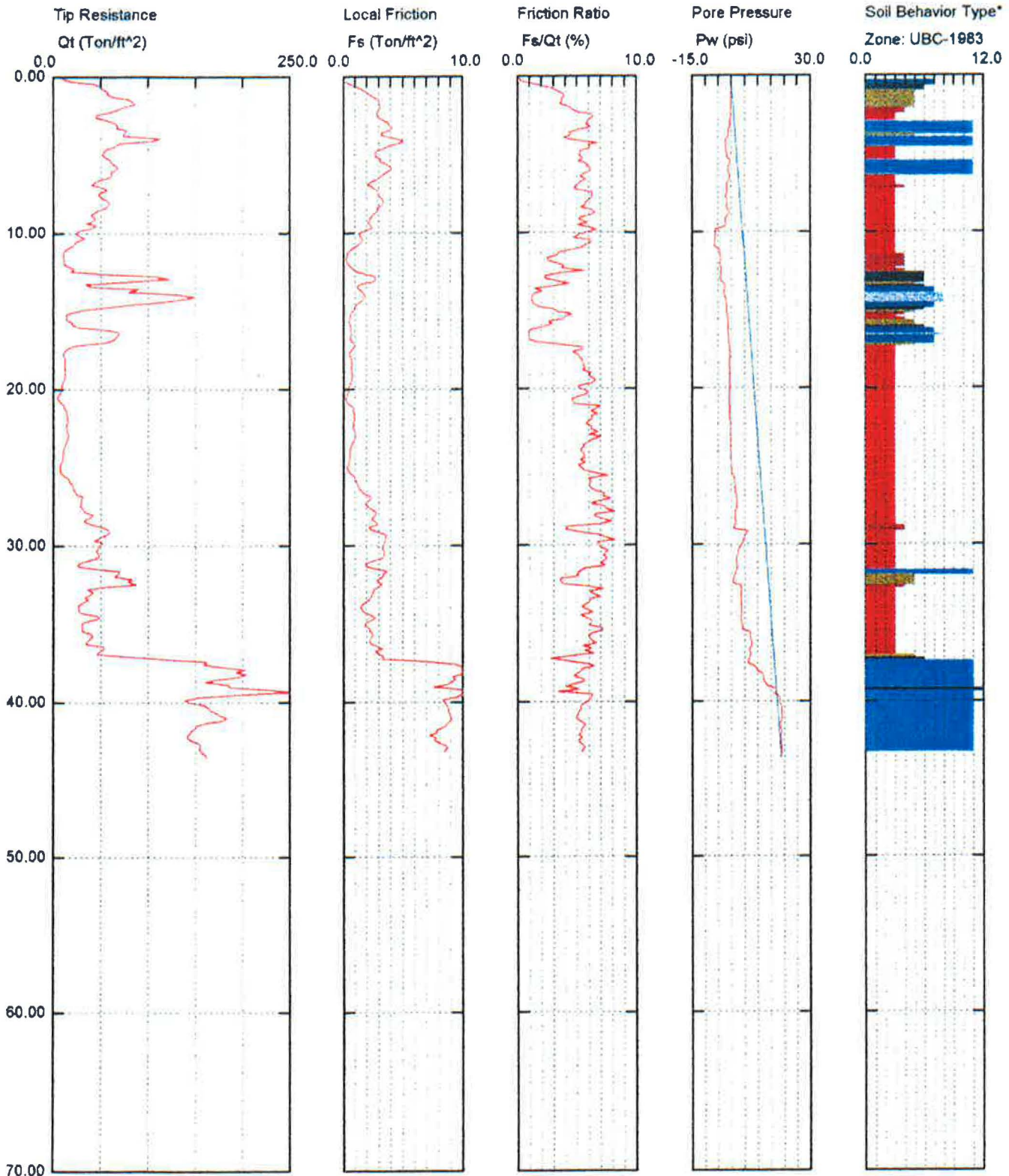
Depth Increment = 0.16 feet

- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

WEST HAZMAT DRILLING CORP.

Operator: B. BUCKNAM
Sounding: CPT203
Cone Used: 510

CPT Date/Time: 08-04-03 11:55
Location: CPT-05
Job Number: WEESE

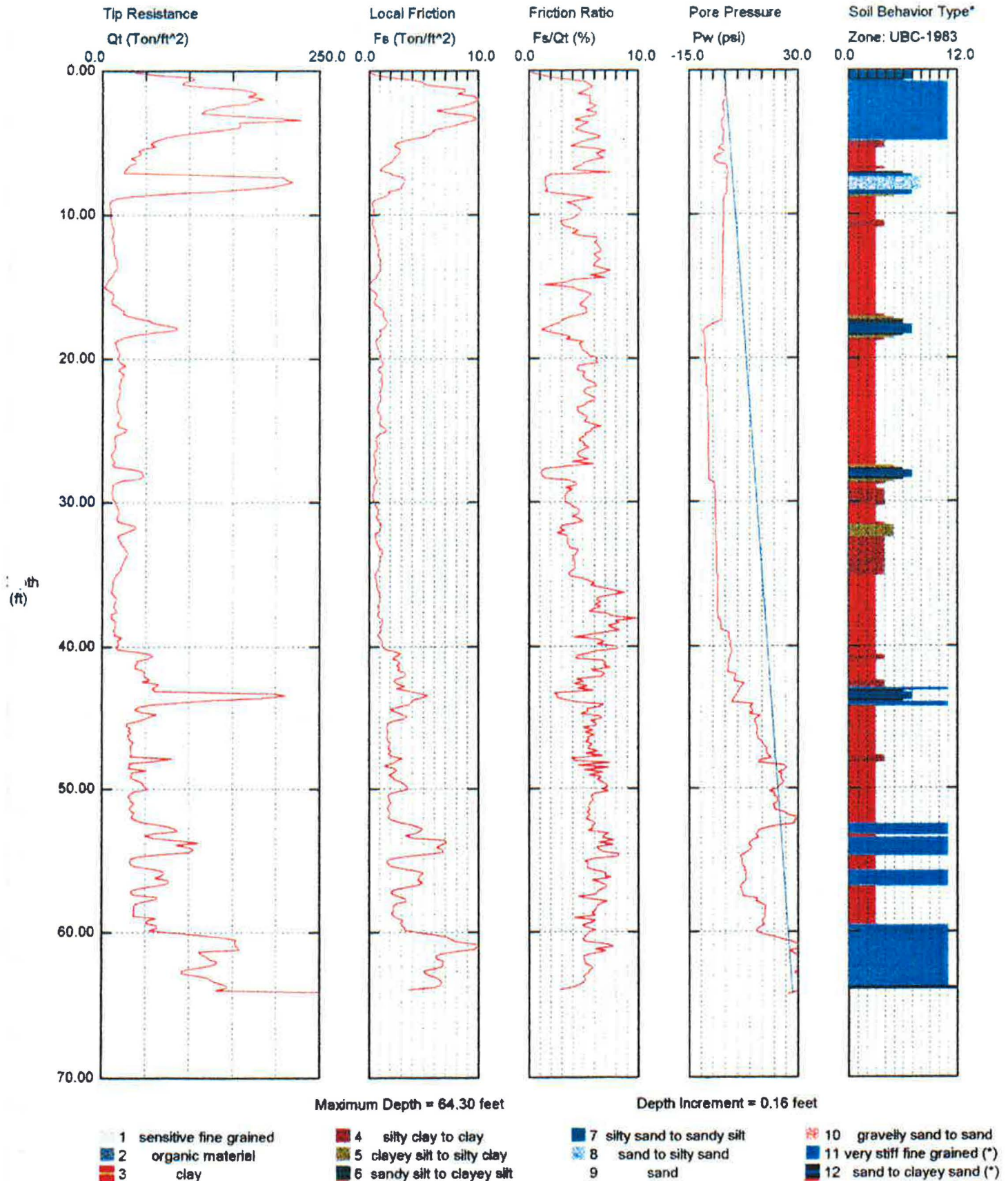


- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

WEST HAZMAT DRILLING CORP.

Operator: B. BUCKNAM
Sounding: CPT204
Cone Used: 510

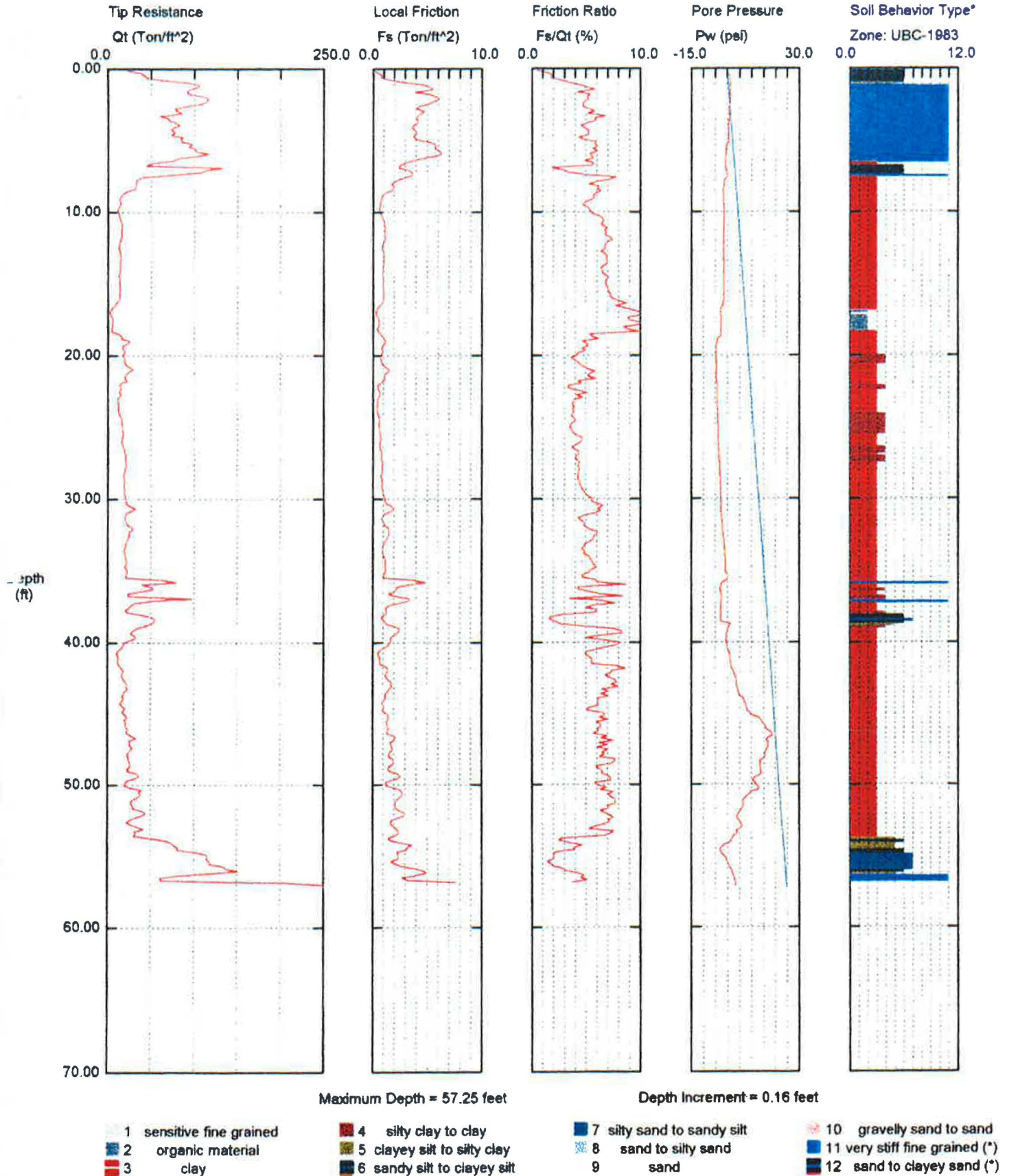
CPT Date/Time: 08-04-03 12:53
Location: CPT-06
Job Number: WEESE



WEST HAZMAT DRILLING CORP.

Operator: B. BUCKNAM
Sounding: CPT205
Cone Used: 510

CPT Date/Time: 08-04-03 14:08
Location: CPT-07
Job Number: WEESE



Appendix C

LB-1 through LB-7

Large-Diameter Borings

From:

Leighton and Associates, 1985a

GEOTECHNICAL BORING LOG

DATE 4/18/85
 PROJECT Weese Property
 DRILLING CO. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE +143

DRILL HOLE No. LB-1
 DRIVE WEIGHT 3700lbs to 27', 2600lbs to 55', 1400lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 1 OF 2
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>MRS/SJ</u> SAMPLED BY <u>MRS</u>
0							CL	Topsoil: Dark brown, damp, soft, silty clay; very fractured, abundant rootlets.
5		C: gradational calcium carbonate filled fractures					CL	Santiago Formation: Dark greenish brown, damp, stiff, claystone; very fractured, calcium carbonate filled fractures upto 2" thick.
		B: EW 12-14 N claystone open fracture	①				SM	@ 6', 2" layer of greenish brown, damp, hard, sandy claystone. White to light gray, damp, dense, silty sandstone; minor calcium carbonate filled fractures, moderately weathered, minor roots. @ 7 1/2', 1" discontinuous layer of pinkish brown sandy clay with minor roots. @ 8', 1/4 to 3/8" open fracture, near vertical, discontinuous.
10		C: horizontal striation: EW 65N					CL	Brown, very stiff, claystone; zone of red oxidation staining, 2" above sharp contact, approximately 1 1/2" thick. @ 11', striated claystone, some minor red oxidation staining.
15		B: EW 5N	②	6 1/10"	113.4	16.9	CL	@ 14', cemented 1 1/2 to 2" thick bed. @ 14 1/2', medium brown, damp, hard, claystone;
		striation: EW 50N claystone	③				sm/sc	Medium brown, damp, dense, clayey to silty sandstone; striated fracture surface, some claystone chunks.
20		Fault F: N45E 50NW						@ 19' to 22 1/2', Fault, slickensided surface @ 20', minor apparent offset.
		c: gradational	④				SM	@ 21', Gray, damp, dense, silty coarse sandstone @ 23', Light to medium gray, damp, dense, silty fine sandstone
25			⑤					@ 25', Coarse grained small concretion. @ 26', slightly lighter gray, some red oxidation staining.
		C: N55E 5-8NW					CL	@ 27', brown to light greenish brown, damp, hard, siltstone to claystone; ~ 1" thick
							CH	@ 27 1/2' Remolded clayseam, continuous, dark chocolate brown, moist, soft, clay; sheared.
							SC	@ 28', medium brown, damp, dense, clayey sandstone. @ 29 1/2', concretionary layer, 2" thick
30								

GEOTECHNICAL BORING LOG

DATE 4/18/85
 PROJECT Weese Property
 DRILLING Co. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±143

DRILL HOLE No. LB-1
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 2 OF 2
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>MRS/SJ</u> SAMPLED BY <u>MRS</u>
30			2	20/9"	121.8	11.7	SM	Santiago Formation: White to light gray, damp, very dense, sandstone; with minor cemented layers. @32', silty to slightly clayey sandstone. @34', light gray, damp, very dense, silty sandstone; massive, minor red oxidation staining. @39', minor discontinuous claystone layers.
35								
40			⑥					
45			3a+b	20	117.4	7.0	SM	Grayish brown, silty fine sandstone; sharp contact. @45', coarser, very dense, sandstone. @47', finer, very dense, sandstone. @48', red oxidation stain, 3" to 4" wide. @51', 2" thick cemented layer. @52', brown, damp, very dense, silty fine sandstone; slightly clayey. @53', light gray, damp, very dense, silty sandstone. @55', medium gray.
50								
55			⑦					
60			4	40/10"	122.2	9.3		Total Depth = 60' Geologically logged to 57' Dry at time of drilling Backfilled 4/18/85

GEOTECHNICAL BORING LOG

DATE 4/18/85
 PROJECT Weese Property
 DRILLING Co. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±84'

DRILL HOLE No. LB-2
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 1 OF 3
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>SJ/RH</u> SAMPLED BY <u>RI/RH</u>
0		B: N40W 8N					SM	Santiago Formation: Off-white, damp, dense, silty fine sandstone; root zone to 4 1/2', lower part has red oxidation staining.
5		C: gradational					CL	Dark gray, damp, hard, claystone; very fractured, blocky, blebs of calcium carbonate upto 1" thick. @6', red clay clasts upto 3" long, hard, ductile.
		C: gradational					ML	@7 1/2', white, damp, hard, very clayey fine sandy siltstone.
		C: NSSE 0-10N					CL	@8', dark olive brown, claystone; ~2' thick
10							SM/SC	White, damp, very dense, silty fine to medium sandstone; upper 1/2" red oxidized staining. @14', blebs of reddish material, becomes clayey. @16' discontinuous clay seam. @18', cemented layer, 1" thick.
15		C: NSSE 0-10N	①	8	123.9	12.9		
		B: N60E B: 4-10N						
20		B: N60E 10N						@21', coarser sandstone, with rip-up clasts of dark olive claystone. @23', red oxidized stained zone, 1/2" thick.
		B: undulating 5-20N					CL	@24', dark olive brown, hard, claystone; blebs of calcium carbonate upto 2" thick.
25		C: undulating					SM/SC	@26', white, damp, very dense, silty sandstone; becomes clayey at contact.
		C: N40E 10-15						@29', discontinuous clay seam; 1/2" to 1 1/2" interbeds.
30			②					

GEOTECHNICAL BORING LOG

DATE 4/18/85
 PROJECT Weese Property
 DRILLING Co. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE +84'

DRILL HOLE No. LB-2
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 2 OF 3
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W F							LOGGED BY <u>SJ/RH</u> SAMPLED BY <u>RI/RH</u>
30			2	14	110.9	16.8	SM	<u>Santiago Formation:</u> White to gray, damp, very dense, silty fine to medium sandstone, massive. @30', semi-cemented zone. @30 1/2', brown to gray interbedded sandstone, siltstone, and claystone; 2 1/2' thick @34', oxidation staining.
35							SM/CL	@37', becomes coarser sandstone. @39', slightly cemented zone.
40		C: abrupt i gradational N45E 6NW B: N40E 8NW	③					@42 1/2', oxidation staining, continuous around boring.
45			3	11	114.8	17.5		@45', increasing silt and clay content, sand slightly coarser. @46', becomes finer grained. @48', 6" thick cemented zone.
50		C: N45E 8-10NW CS: NS 6SW C: gradational					CL	Brown, moist, hard, sandy claystone. @53' Discontinuous, bentonitic appearing, high angle clay seam.
55		C: gradational					SC	Off-white, moist, very dense, clayey sandstone
60		C: undulating generally dips to NW					SM	@57 1/2', gray to off-white, dense, silty sandstone; massive no apparent bedding surfaces.

GEOTECHNICAL BORING LOG

DATE 4/18/85
 PROJECT Weese Property
 DRILLING Co. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE +84'

DRILL HOLE No. LB-2
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 3 OF 3
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
								LOGGED BY <u>SJ/RH</u> SAMPLED BY <u>RI/RH</u>
60			4	35		0	CL	Santiago Formation: Dark olive gray, damp, very stiff to hard, claystone; massive, concordal fractures, occasional manganese oxide staining developed on fractures.
65							SM	Offwhite to light gray, moist to wet, very dense, silty sandstone. @64', large open fractures, wet @66', rapid groundwater seepage from open fractures upto 6" wide. @67 1/2', continuous brecciated zone
70							CL	Dark olive gray, damp, hard claystone.
			5	38				↓ Total Depth = 73' Geologically logged to 71' Seepage at 66' Backfilled 4/19/85
75								
80								
85								
90								

GEOTECHNICAL BORING LOG

DATE 4/19/85
 PROJECT Weese Property
 DRILLING CO. Larvie
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE +94'

DRILL HOLE No. LB-3
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 1 OF 3
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RH/SJ</u> SAMPLED BY <u>RH</u>
0			①				SM	<u>Santiago Formation:</u> Gray to white, damp, dense, silty fine sandstone; weathered
5	C: N70E 14NW to undulating		②				CL/SM	Dark gray, damp, hard, claystone; red oxidized interbedded cemented silty sand
	C: gradational						ML/CL	Gray, damp, very dense, slightly sandy siltstone to claystone; with irregular, discontinuous red oxidized stained seams upto 1/2" thick, some steeply dipping to the west, upto 16" long.
10	F: N30E 15NW						SM	@8', cemented zone of pink fine sandstone, discontinuous, calcium carbonate filled fracture.
	C: gradational						CL	@10', dark olive gray, very stiff claystone; 1' thick.
	C: gradational						ML	@11', siltstone becomes friable.
							SM	@12 1/2', white fine sandstone.
15	C: N35E 15NW to undulating		1	8	127.3	7.8	CL	@15', pink stained zone. Dark gray to brown, damp, hard, silty claystone.
20	C: undulating B: EW 8-12N B: N5E 5NW						CL/ML SM/CL	@19', Zone of red claystone and siltstone; 1/2" thick. @19', Interbedded sandstone and claystone.
	C: undulating						CL	@22', brown claystone layer; 1" thick.
	C: generally horizontal						SM	@23', white silty sandstone; massive.
25	C: abrupt & gradational						CL	@25 1/2', dark brown claystone; 2" thick.
							ML	@26', dark gray, siltstone; micaceous, 6" thick.
							CL	@28', cemented sandy clay; 1' thick.
30							SM	@29', white sandstone; well cemented.

GEOTECHNICAL BORING LOG

DATE 4/19/85
 PROJECT Weese Property
 DRILLING Co. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±94

DRILL HOLE No. LB-3
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 2 OF 3
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RH/SJ</u> SAMPLED BY <u>RH</u>
30		C: Horizontal	2	13	112.3	19.5	CL	Santiago Formation: Dark olive brown, damp, hard, slightly silty claystone. @33', several blebs upto 4" of calcium carbonate.
35		C: undulating					SC	White, damp, very dense to hard, clayey sandstone; at contact zone of pink staining. @40', clay content increases.
40		B: N10E 8-25NW B: N10W 15SN, generalized B: N20E 5NW					CL SC	@42' dark brown, claystone; 2" thick. @42 1/4', sandstone becomes dark brown.
45			3	20 3/8"	127.9	8.4	CL SM/ML	@44', thin clay seam, fracture parallel to seam filled with calcium carbonate. @45 1/2', white to gray, moist, very dense silty sandstone to sandy siltstone; slightly clayey. @46' becomes coarser sandstone.
50		CS: N10W 45NE B: N20E 15NW C: N20E 15NW C: N30E 15-20NW B: N45E 15N C: N10E 5-15N					SC/CL CL	@47', interbedded sandstone and claystone; locally claystone is crushed, 6" thick. @48' gray claystone; cemented. @49' fracture, 1/16" thick, gypsum filled. @50' moisture content increases to wet. @51 1/2', brown clay seam; 1/4" thick, along bedding.
55							CL/SC	Interbedded dark gray to brown, silty claystone with sandstone
							SC	White, wet, dense, silty sandstone.
60		CS: N-S 40E					CL	@57' clay seam; hard, with gypsum infilling, pink staining, 6" thick.

GEOTECHNICAL BORING LOG

DATE 4/19/85
 PROJECT Weese Property
 DRILLING Co. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE +94

DRILL HOLE No. LB-3
 DRIVE WEIGHT 3700 lbs to 27', 7600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 3 OF 3
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RH/SJ</u> SAMPLED BY <u>RH</u>
60			4	40	124.2	12.2	SM	<u>Santiago Formation:</u> White, damp, very dense, silty fine sandstone; micaceous, cross bedding. @63', slight bellling of the hole, becomes massive, slightly clayey. @64 1/2', cemented zone, 2 1/2' thick. @66' Seepage through vertical fracture; slow. @66 to 67', numerous high angle, polished, clay surfaces, generally dipping north.
65	C: sharp horizontal					9		
70	C: gradational to N30E 20NW		5	38	117.8	15.2	ML/CL	Dark brown, damp, hard, siltstone and claystone. @69 1/2', disturbed zone, 6" thick.
75								Sandstone. Total Depth = 72' Geologically logged to 71' Seepage at 66' Backfilled 14/19/85

GEOTECHNICAL BORING LOG

DATE 4/21/85
 PROJECT Weese Property
 DRILLING CO. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±34'

DRILL HOLE No. LB-4
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 1 OF 2
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
0	W E							LOGGED BY <u>RLW</u> SAMPLED BY <u>RLW</u>
0							SM	<u>Alluvium:</u> Medium gray brown, very moist, medium dense, silty fine sand; scattered clasts of dense silty sand upto 3" in diameter roots and rootlets.
0		C: undulating and abrupt					CL/CH	<u>Colluvium:</u> Very dark brown, very moist, firm, slightly sandy clay.
0		C: undulating and gradational						↓ @4' high concentration of calcium carbonate blebs.
5		C: gradational					SM	<u>Ancient Landslide:</u> Light brown, very moist to wet, medium dense to dense, very silty fine sand; animal burrows.
5		F: N55E 85SE					SM	Light gray to off-white, very moist to wet, dense, silty fine sand; highly fractured with hairline to 1/8" wide openings, fractures are steeply dipping, calcium carbonate developed along majority of fracture surfaces.
10			② 1	4	123.3	13.9		@8' very rapid groundwater seepage; several gallons per minute.
10		C: N68E 40NW					CL	Medium brown to olive green, very moist, stiff to very stiff, slightly silty clay; very disturbed, contains blebs of calcium carbonate upto 4" thick, numerous shears.
15		CS: N25E 35NW	③				CL	Medium brown to olive green, wet, firm, slightly silty clay; crushed and very disturbed.
15		RS: N40E 18NW					CH	@16' Rupture Surface; continuous, very polished, 1/8 to 1/2" thick, olive green, very moist to wet, plastic clay seam.
20			2	6	117.2	15.8	SM	<u>Santiago Formation:</u> Very light brown gray, moist to very moist, dense to very dense, silty fine sandstone.
25							SM	Light gray brown, very moist to wet, dense to very dense, silty fine sandstone.
30								

GEOTECHNICAL BORING LOG

DATE 4/21/85
 PROJECT Weese Property
 DRILLING CO. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±34'

DRILL HOLE No. LB-4
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 2 OF 2
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RLW</u> SAMPLED BY <u>RLW</u>
30			④ 3	19	122.3	13.1	SM	Santiago Formation: Light gray brown, very moist to wet, dense to very dense, silty fine sandstone
35							CL	Medium olive gray, moist, very stiff, silty claystone.
							SM	Mottled olive, red, and medium brown, very moist to wet, dense to very dense, silty fine sandstone
40			4	20 1/4"	125.2	10.3	SM	Light gray brown, very moist to wet, dense to very dense, silty fine to medium sandstone
45								
50								
55								Total Depth = 53' Geologically logged to 25' Seepage at 8' Caving below 8' Backfilled 4/21/85

GEOTECHNICAL BORING LOG

DATE 4/22/85
 PROJECT Weese Property
 DRILLING Co. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±108

DRILL HOLE No. LB-5
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 1 OF 2
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RLW/SJ</u> SAMPLED BY <u>RLW</u>
0							SC	<u>Topsoil:</u> Medium brown, damp, dense, very clayey fine sand; roots and rootlets, very scattered gravel sized clasts upto 1" in diameter.
5		c: gradational					SM	<u>Ancient Landslide:</u> Medium orange brown, damp, dense, silty fine sand; rare cobble sized clasts upto 6" in diameter, occasional rip-up clasts of brown clayey sand upto 3" in diameter; massive, no apparent bedding surfaces.
10		CS: N78E 6NW	1	5	107.1	20.6	ML	@9' dark gray, moist, firm to stiff, very silty clay seam; continuous, ± 1" thick, abundant calcium carbonate veins throughout, slightly remolded appearance, moderately laminated.
15		c: gradational					SM	Light to medium gray, moist, firm, very fine sandy silt; slightly micaceous, moderate increase in sand content with depth.
20		CS: N80E 20NW					CL	Light to medium gray, moist, dense, very silty fine sand, @13' and 14', two discontinuous concretionary nodules.
25		F: N68E 71NW					SM	@15.5' medium brown, moist, firm to stiff, clay seam; remolded, laminated with numerous shears and polished surfaces, underlain by 1" thick olive green silty sand, overlain by numerous discontinuous concretionary nodules.
30		CS: N88W 11NE					CL	Light gray, moist, medium dense, silty fine to medium sand; micaceous, very friable, contains high angle fractures with hairline to 1/8" wide openings.
35		CS: undulating to N14W 55NE	2	5	105.4	22.4	CL	@19.5' discontinuous 1" thick lense of brown clay pods, continuous around the boring.
40		CS: N68E 2NW					CL	@22', becomes wet.
45		CS: undulating to N12E 19NW					CL	@23', abrupt change to ± 1" thick continuous medium brown, firm, clay seam; laminated, at base of the clay seam is a slightly polished, moderately sheared clay seam, water seepage above clay seam.
50							SM	Medium brown gray, moist to wet, stiff, silty clay; moderately laminated.
55								@25', continuous olive green, clay seam; highly polished and sheared, striations are in dip direction, scattered concretionary nodules developed above clay seam, water seepage above clay seam.
60								@27', 1/4" to 1/2" thick medium brown, continuous laminated clay seam.

GEOTECHNICAL BORING LOG

DATE 4/22/85
 PROJECT Weese Property
 DRILLING CO. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±108

DRILL HOLE No. LB-5
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 2 OF 2
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RLW/SJ</u> SAMPLED BY <u>RLW</u>
30		c: undulating					SM	<u>Ancient Landslide:</u> Medium brown gray, moist to wet, stiff, silty clay; moderately laminated. Medium gray, wet to saturated, dense, silty fine sand. @28.5', 3" to 4" thick continuous, olive gray, laminated, clay seam; not remolded, one preferred surface.
35							ML	Medium gray, wet, stiff, clayey silt, slightly fine sandy; discontinuous concretionary nodules above and below contact, scattered concretionary nodules throughout.
40		c: undulating to E-W, 4N	3	18	124.1	12.3	CL	@39', 1/2" to 1 1/2" thick, continuous, brown laminated, stiff, plastic clay seam/rupture surface; one preferred surface.
45		c: gradational c: N60E 15NW					SM	<u>Santiago Formation:</u> Light to medium gray, wet, dense to very dense, silty fine sandstone; slightly micaceous.
							SM	@42', light to medium gray, wet, very dense, silty fine to, medium sandstone; slightly micaceous, approximately 1/2' thick.
							SM	Medium gray, wet, dense, silty fine sandstone.
		c: gradational c: gradational					ML	@46', medium brown, wet, very stiff, siltstone; 1' thick.
							SM	Medium gray brown, wet, dense to very dense, silty fine sandstone.
50								
55			4	16	129.9	11.8		
60								Total Depth = 56' Geologically logged to 53' Seepage at 23' and 25' No caving Backfilled 4/22/85

GEOTECHNICAL BORING LOG

DATE 5/21/85
 PROJECT Weese Property
 DRILLING Co. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±72'

DRILL HOLE No. LB-6
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 1 OF 2
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RLW</u> SAMPLED BY <u>RLW</u>
0							SC	<u>Ancient Landslide:</u> Medium to dark brown, damp, very loose to loose, very clayey fine to medium sand; scattered subrounded gravel sized clasts upto 1 1/2" in diameter, roots and rootlets.
5		c: undulating					CL	Dark brown, moist, firm to stiff, very sandy clay; minor root development, small gravel size clasts upto 1/2" in diameter.
		c: gradational					SM	Medium orange brown and mottled off-white, moist to wet loose, silty fine to medium sand; pods of off-white silty fine sand upto 2" in diameter, slightly micaceous.
10		c: undulating ①		1 push			ML	Light olive green, mottled medium olive and dark brown, very moist to wet soft, sandy silt; rip-up clasts of dark brown sandy clay and off-white silty sand; blocky texture, calcium carbonate veinlets, locally stained with iron oxide, slightly micaceous. @13' to 15', numerous calcium carbonate in-filled voids upto 2" in diameter.
15		c: undulating to N55E 33SE					SM	Medium gray, mottled off-white and orange brown, wet to very wet, loose, silty fine to medium sand.
		c: very undulating					ML	Medium olive green, very moist to wet, soft to firm, slightly sandy silt; very blocky, locally stained with iron oxide. @17', numerous calcium carbonate pods upto 3" in diameter, moderate groundwater seepage.
20		c: undulating ②	2	push 9" + 1			SM	Light gray, saturated, medium dense, silty fine to medium sand. @20', very rapid groundwater seepage, some caving in this zone. @21.5', medium olive gray, 1/16" to 1/8" thick, continuous clay seam / rupture surface; stratified, laminated, plastic.
25		CS/RS: undulating to N18E, 6NW to N36E, 15NW to E-W, 8N to N40E, 7NW					SM	<u>Santiago Formation:</u> Medium gray, moist, dense, silty fine to medium sandstone; micaceous, very massive, no apparent bedding surfaces, locally cemented. @25', very rapid groundwater in flowing.
		c: undulating to N78E, 10NW					SM	Medium green, wet, dense to very dense, silty fine sandstone; micaceous.
		c: N52E 8NW					SM	Very light gray, wet to saturated, dense, silty fine to medium sandstone; micaceous.
30		c: N10W 2NE					SM	

GEOTECHNICAL BORING LOG

DATE 5/21/85
 PROJECT Weese Property
 DRILLING CO. Larive
 HOLE DIAMETER 30"
 ELEVATION TOP OF HOLE ±72'

DRILL HOLE No. LB-6
 DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'
 REF. OR DATUM Mean Sea Level

SHEET 2 OF 2
 PROJECT No. 4850512-01
 TYPE OF RIG Bucket
 DROP 12 IN

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RLW</u> SAMPLED BY <u>RLW</u>
30			③ 3	14			SM	Santiago Formation: Very light gray, wet to saturated, dense, silty fine to medium sandstone; micaceous. Medium olive, very moist, dense to medium dense, silty fine to medium sandstone; micaceous, contact with overlying unit is slightly cemented.
35		c: gradational					SM-ML	Medium to dark olive, very moist to wet, dense to hard, fine sandy siltstone to silty fine sandstone; contact with overlying unit is moderately cemented.
40		cemented zone: N32W 17NE	④ 4	17				@40', continuous, ±3" thick cemented layer.
45		c: N15E 12W					CL	Dark olive green, very moist, hard, silty claystone.
50			5	12				↓
55								Total Depth = 51' Geologically logged to 49' Seepage at 17' and 20' Water table at 25' Caving at 20' Backfilled 5/21/85
60								

GEOTECHNICAL BORING LOG

DATE 5/21/85

DRILL HOLE No. LB-7

SHEET 1 OF 2

PROJECT Weese Property

PROJECT No. 4850512-01

DRILLING Co. Larive

TYPE OF RIG Bucket

HOLE DIAMETER 30"

DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80'

DROP 12 IN

ELEVATION TOP OF HOLE +54'

REF. OR DATUM Mean Sea Level

DEPTH FEET	GRAPHIC LOG	ATTITUDES	TUBE SAMPLE No.	BLOWS PER FOOT	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION
	W E							LOGGED BY <u>RLW</u> SAMPLED BY <u>RLW</u>
0							CL	<u>Topsoil:</u> Medium brown, moist, stiff, very sandy clay; roots and rootlets, scattered gravel and cobble sized clasts.
5		c: gradational					SM	<u>Ancient Landslide:</u> Medium brown orange, moist, medium dense, silty fine to medium sand.
		c: gradational					SM	Light orange brown to light gray, moist to wet, medium dense, silty fine to medium sand. @ 8', moisture content becomes wet to saturated. @ 9', Caving of saturated sand.
10			① 1	Push 6" + 1			SM	Light gray, very wet to saturated, medium dense, silty fine to medium sand; micaceous, heavy caving.
		c: gradational					CL	@ 13', rapid groundwater seepage. @ 15', very heavy caving, unsafe to log below this depth, very rapid groundwater seepage. @ 16', Medium brown, polished, striated, continuous, clay seam.
15		CS/RS(?)					SM	<u>Santiago Formation:</u> Light gray, moist, very dense, silty fine to medium sandstone; micaceous.
20			② 2	7				
25								
30							ML	Medium olive gray, moist, very stiff, fine sandy siltstone; micaceous

DATE 5/21/85 DRILL HOLE No. LB-7 SHEET 2 OF 2
PROJECT Weese Property PROJECT No. 4850512-01
DRILLING Co. Larive TYPE OF RIG Bucket
HOLE DIAMETER 30" DRIVE WEIGHT 3700 lbs to 27', 2600 lbs to 55', 1400 lbs to 80' DROP 12 IN
ELEVATION TOP OF HOLE ± 54' REF. OR DATUM Mean Sea Level

LEIGHTON & ASSOCIATES

Appendix C (continued)

B-1 and B-2

Small-Diameter Borings

From:

Leighton and Associates, 1985a

GEOTECHNICAL BORING LOG

Date 4/17/85 Drill Hole No. B-1 Sheet 1 of 2 -
 Project Weese Property Job No. 4850512-01
 Drilling Co. Morrison Type of Rig B-53/Rotary Wash
 Hole Diameter 4" Drive Weight 140 lbs Drop 30 in.
 Elevation Top of Hole ±30' Ref. or Datum Mean Sea Level

Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION	
								Logged by <u>RH</u>	Sampled by <u>RH</u>
0			①				CL	Alluvium: Light brown, damp, soft clay.	
5			1	11	92.3	31.9	CL/CH	Dark gray to black, moist, stiff, clay; numerous roots and organics.	
10			2	14	109.9	18.9	CL/SC	Very dark gray, moist, stiff, sandy clay to clayey sand. @12', becomes harder drilling.	
15			3	17	92.4	32.4	CL	Dark olive gray, moist to wet, stiff, sandy clay.	
20			4	8 12 14			CL/CH	Dark brown to black, moist, very stiff, sandy clay; numerous rootlets. @22', becomes harder drilling.	
25			5	30	101.1	24.7	ML	Mottled light to medium brown, moist, very stiff, clayey silt; slightly sandy, micaceous.	
30			6	29	94.2	30.4	CL	Mottled mix of olivebrown to gray, moist, very stiff, silty clay; numerous blebs of calcium carbonate, micaceous.	

GEOTECHNICAL BORING LOG

Date 4/17/85 Drill Hole No. B-1 Sheet 2 of 2-
 Project Weese Property Job No. 4850512-01
 Drilling Co. Morrison Type of Rig B-53/Rotary Wash
 Hole Diameter 4" Drive Weight 140 lbs Drop 30 in.
 Elevation Top of Hole ± 30' Ref. or Datum Mean Sea Level

Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION		
								Logged by	Sampled by	
30			7	13			CL	Alluvium:		
35				15				CL	Mottled mix of olive brown to gray, moist, very stiff, silty clay; numerous blebs of calcium carbonate, micaceous.	
				17				Mottled intermixed olive brown, dark gray, and medium gray, moist, very stiff, silty clay; some clay and sandy clay material, minor amounts of calcium carbonate.		
40			8	77			CL/sc	Santiago Formation:		
								Medium gray to white, damp, hard, sandy claystone; slightly silty.		
								@43', becomes harder drilling.		
45			9	75 1/4"				Total Depth = 45'		
								Piezometer installed to 45'		
								Groundwater at 2.29', measured on 5/14/85		

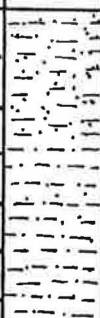
GEOTECHNICAL BORING LOG

Date 4/17/85 Drill Hole No. B-2 Sheet 1 of 2-
 Project Weese Property Job No. 4850512-01
 Drilling Co. Morrison Type of Rig B-53/Rotary Wash
 Hole Diameter 4" Drive Weight 140 lbs Drop 30 in.
 Elevation Top of Hole ±35' Ref. or Datum Mean Sea Level

Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION	
								Logged by <u>RH</u>	Sampled by <u>RH</u>
0			①				CL-SC	<u>Artificial Fill:</u> Dark olive brown, moist, stiff, clay; contains chunks and bits of hard claystone and grayish white sandy clay.	
5			1	15	101.8	25.2	ML	<u>Alluvium:</u> Black, moist, stiff, very clayey silt, trace of root hairs and organics.	
10			2	13	97.4	25.7			
15									
20			3	30			CL	Dark brown to black, wet, very stiff, clay.	
25			4	15			CL	Gray, wet, stiff, clay; minor amounts of sand, micaceous.	
30			5	10 10 12			CL/SC	Light gray to white, wet, very stiff, sandy clay; micaceous, blocky.	

GEOTECHNICAL BORING LOG

Date 4/17/85 Drill Hole No. B-2 Sheet 2 of 2-
 Project Weese/Oceanside Job No. 4850512-01
 Drilling Co. Morrison Type of Rig B-53/Rotary Wash
 Hole Diameter 4" Drive Weight 140 lbs Drop 30 in.
 Elevation Top of Hole +35' Ref. or Datum Mean Sea Level

Depth Feet	Graphic Log	Attitudes	Tube Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	GEOTECHNICAL DESCRIPTION	
								Logged by	Sampled by
30								<u>RH</u>	<u>RH</u>
35			6	24			CL/sc	<u>Alluvium:</u> Light gray to white, wet, very stiff, sandy clay; micaceous, blocky. @ 32', becomes very hard drilling. Medium red brown, moist, very stiff, clayey silt with abundant fine sand; micaceous, with numerous zones of blocky, dark gray claystone and gray slightly sandy clay.	
			7	7 9 12					
40								Total Depth = 36.5' Piezometer installed to 12' Groundwater at 7.10', measured on 5/14/85	

Appendix C (continued)

T-1 through T-10

Exploratory Trenches

From:

Leighton and Associates, 1985a

Project Name: <u>Weese/Oceanside</u>		Logged By: <u>RLW</u>		ENGINEERING PROPERTIES			
Project Number: <u>4850512-01</u>		Elevation: <u>±115'</u>					
Equipment: <u>JD 510-C/Trackhoe</u>		Location: <u>See Geotechnical Map</u>					
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c:gradational	<u>TOPSOIL</u>		Topsoil	SM/SC			
	① Medium brown, damp, medium dense to dense, silty to clayey fine sand; roots and rootlets, minor amount of desiccation cracks.						
c:undulating	<u>LANDSLIDE DEBRIS</u>		Qls	SM			
	② Medium slightly red-brown, moist, dense, silty fine sand; jumbled, rip-up clasts of light brown silty sand, very scattered gravel-sized clasts to 1" in diameter.						
	③ Medium red-brown, moist to very moist, firm, very fine sandy clay; high concentration of calcium carbonate near contact, very jumbled in appearance.		Qls	CL			
Total depth = 12'		No caving					
No ground water encountered		Backfilled 4/23/85					
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 18° TREND: N68W							

Project Name: <u>Weese/Oceanside</u>		Logged By: <u>RLW</u>		ENGINEERING PROPERTIES			
Project Number: <u>4850512-01</u>		Elevation: <u>±125'</u>					
Equipment: <u>JD510-C/Trackhoe</u>		Location: <u>See Geotechnical Map</u>					
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c:gradational (over 1')	j:N41°W;85°NE	<u>TOPSOIL</u> ① Medium brown, damp, medium dense to dense, very silty to clayey fine sand; roots and rootlets, abundant amount of desiccation cracks with openings 1/8" to 1/4" wide.	Topsoil	SM/SC			
		<u>LANDSLIDE DEBRIS</u> ② Light to medium red-brown, damp to moist, dense, silty fine to medium sand; massive, no apparent bedding surfaces, jointed, manganese oxide staining developed on majority of joint surfaces. Total depth = 10' No ground water encountered No caving Backfilled 4/23/85	Q1s	SM			
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 25° TREND: N70°W							

Project Name: <u>Weese/Oceanside</u>		Logged By: <u>RLW</u>		ENGINEERING PROPERTIES			
Project Number: <u>4850512-01</u>		Elevation: <u>±138'</u>					
Equipment: <u>JD 45C-C/Trackhoe</u>		Location: <u>See Geotechnical Map</u>					
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c: gradational (over ±6') c: cs: N64°W; 11°NE j: N62°E; 85°SE (approximate)	<u>TOPSOIL</u> ① Medium brown, damp, medium dense, very silty to clayey fine sand; roots and rootlets, minor amount of desiccation cracks.		Topsoil	SM/SC			
	<u>SANTIAGO FORMATION</u> ② Light to medium slightly red-brown, damp to moist, dense, silty fine to medium sand; very minor amount of calcium carbonate stringers, weathered.		Ts	SM			
	③ Light gray to off white, moist, dense to very dense, silty fine to medium sand; high angle joints, calcium carbonate and iron oxide developed on these joints, at contact with overlying unit is a 1/8" to 1/2" thick, continuous clay seam.		Ts	SM			
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 16° TREND: N							
Total depth = 10' No ground water encountered No caving Backfilled 4/23/85							

Project Name: <u>Weese/Oceanside</u>			Logged By: <u>RLW</u>		ENGINEERING PROPERTIES		
Project Number: <u>4850512-01</u>			Elevation: <u>+115'</u>				
Equipment: <u>JD 450-C/Trackhoe</u>			Location: <u>See Geotechnical Map</u>				
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c:undulating	<u>TOPSOIL</u> ① Medium brown, moist, medium dense, clayey fine to medium sand; roots and rootlets, very scattered gravel and cobble-sized clasts.		Topsoil	SC			
	<u>LANDSLIDE DEBRIS</u> ② Light slightly red-brown, moist, dense, silty fine to medium sand; minor calcium carbonate stringers, rare cobble-sized clasts.		Qls	SM			
	③ Medium gray-brown, moist, stiff, very silty clay; abundant amount of calcium carbonate blebs to 3" in diameter near contact, 1" thick, continuous sheared clay seam @ 9.5', very jumbled and disturbed. Total depth = 10' No ground water encountered No caving		Qls	CL			
cs:N10°E;30°NW (approximate)			Backfilled 4/23/85				
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 21° TREND: N-S							

501-A - (3/77)

Leighton & Associates

Project Name: <u>Weese/Oceanside</u>		Logged By: <u>RLW</u>		ENGINEERING PROPERTIES			
Project Number: <u>4850512-01</u>		Elevation: <u>±125'</u>					
Equipment: <u>JD 450-C/Trackhoe</u>		Location: <u>See Geotechnical Map</u>		TRENCH NO. <u>T-5</u>			
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c:undulating		<u>TOPSOIL</u> ① Medium brown, moist, medium dense, clayey fine sand; gravel and cobble-sized clasts to 6" in diameter; roots and rootlets.	Topsoil	SC			
c:undulating		<u>LANDSLIDE DEBRIS</u> ② Light to medium brown, moist, dense, silty fine sand; scattered gravel-sized clasts, minor rip-up clasts of brown silty clay, contact with underlaying unit has abundant calcium carbonate blebs to 4" in diameter, above 1/8" to 1/2" wide, discontinuous silty clay seam. ③ Light brownish white, mottled yellow-brown, moist, medium dense, silty fine sand; rip-up clasts of brown silty sand to 3" in diameter, calcium carbonate blebs.	Q1s	SM			
		Total depth = 9.5' No ground water encountered No caving	Q1s	SM			
Backfilled 4/23/85							
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 21° TREND: N88°W							

LOG OF TRENCH NO.: T-5

Project Name: <u>Weese/Oceanside</u>		Logged By: <u>RLW</u>		ENGINEERING PROPERTIES			
Project Number: <u>4850512-01</u>		Elevation: <u>±128'</u>					
Equipment: <u>JD 450-C/Trackhoe</u>		Location: <u>See Geotechnical Map</u>					
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c: gradational	<u>TOPSOIL</u> ① Medium brown, damp, medium dense, very clayey fine sand; roots and rootlets.		Topsoil	SC			
	<u>LANDSLIDE DEBRIS</u> ② Medium slightly orange-brown, damp, dense, silty fine sand; minor root development, @ 9' discontinuous 1" thick, dark brown clay lens, slight lightening of color with depth. Total depth = 12' No ground water encountered No caving Backfilled 4/23/85		Q1s	SM			
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 18° TREND: N							

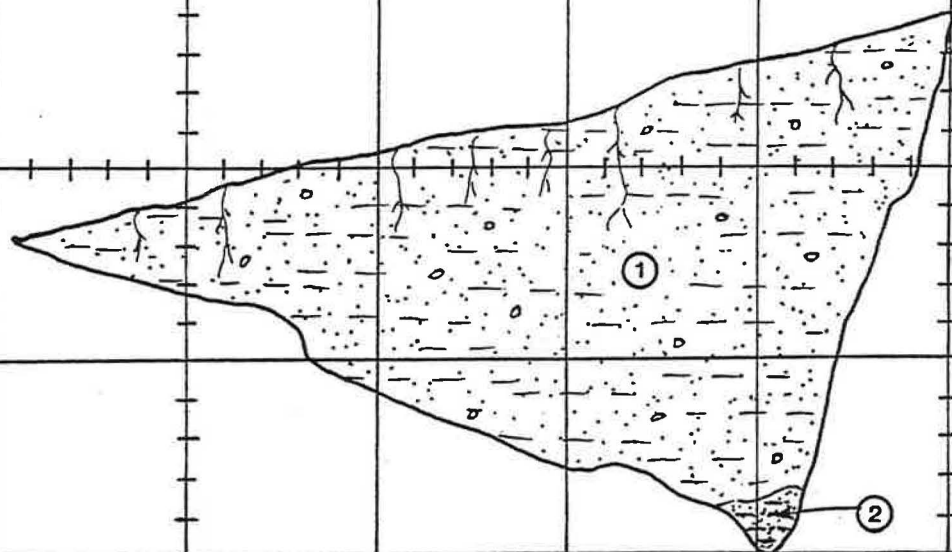
Project Name: <u>Weese/Oceanside</u>		Logged By: <u>RLW</u>		ENGINEERING PROPERTIES			
Project Number: <u>4850512-01</u>		Elevation: <u>±58'</u>					
Equipment: <u>JD 450-C/Trackhoe</u>		Location: <u>See Geotechnical Map</u>		TRENCH NO. <u>T-7</u>			
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c:gradational	<u>TOPSOIL</u> ① Medium gray-brown, damp, stiff, very fine sandy clay; roots and rootlets.		Topsoil	CL			
	<u>LANDSLIDE DEBRIS</u> ② Medium orange-brown, damp to moist, dense, silty fine to medium sand; high angle fractures with openings hairline to 1/8" wide, calcium carbonate developed on fracture surfaces. ③ Medium gray-brown, moist, firm, very fine sandy silt; very jumbled. Total depth = 8.5' No ground water encountered No caving Backfilled 4/23/85		Q1s	SM			
c:gradational			Q1s	ML			
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 10° TREND: N68°W							

Project Name: <u>Weese/Oceanside</u>			Logged By: <u>RLW</u>		ENGINEERING PROPERTIES		
Project Number: <u>4850512-01</u>			Elevation: <u>±68'</u>				
Equipment: <u>JD 450-C/Trackhoe</u>			Location: <u>See Geotechnical Map</u>		TRENCH NO. <u>T-8</u>		
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c:gradational		<u>TOPSOIL</u> ① Medium to dark brown, damp, stiff, fine sandy clay; roots and rootlets.	Topsoil	CL			
c:gradational		<u>LANDSLIDE DEBRIS</u> ② Off white, damp, dense, very silty, very fine sand; calcium carbonate filled fractures with openings hairline to 1/8", at base ±4" thick zone of calcium carbonate enrichment. ③ Medium gray, moist, stiff, clayey silt; very broken and jumbled.	Q1s	SM			
		Total depth = 9' No ground water encountered No caving Backfilled 4/23/85	Q1s	ML			
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 23° TREND: N68°W							

Project Name: <u>Weese/Oceanside</u>		Logged By: <u>RLW</u>		ENGINEERING PROPERTIES			
Project Number: <u>4850512-01</u>		Elevation: <u>±110'</u>					
Equipment: <u>JD 450-C/Trackhoe</u>		Location: <u>See Geotechnical Map</u>		TRENCH NO. <u>T-9</u>			
GEOLOGIC ATTITUDES	DATE: <u>4/23/85</u>	DESCRIPTION:	GEOLOGIC UNIT	U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)
c:gradational	<u>TOPSOIL</u> ① Medium brown, damp, stiff, very fine sandy clay; roots and rootlets.		Topsoil	CL			
	<u>LANDSLIDE DEBRIS</u> ② Medium orange-brown to light brown, moist, dense, silty fine sand; rip-up clasts of dark brown silty clay to 2" in diameter, minor root development.		Qls	SM			
c:undulating	③ Medium gray-brown, moist, firm, fine sandy silt; very jumbled in appearance, voids to 3" in diameter in-filled with soft calcium carbonate. Total depth = 9' No ground water encountered No caving Backfilled 4/23/85		Qls	ML			
GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 18° TREND: N32°W							

Project Name: <u>Weese/Oceanside</u>		Logged By: <u>RLW</u>		TRENCH NO. <u>T-10</u>		ENGINEERING PROPERTIES					
Project Number: <u>4850512-01</u>		Elevation: <u>±105'</u>				U.S.C.S.	Sample No.	Moisture (%)	Density (pcf)		
Equipment: <u>JD 450-C/Trackhoe</u>		Location: <u>See Geotechnical Map</u>		GEOLOGIC ATTITUDES						DATE: <u>4/23/85</u>	
c:undulating		<u>TOPSOIL/LANDSLIDE DEBRIS</u>		Topsoil/ Qls		SC					
		① Dark brown, moist, dense, clayey fine sand; abundant roots and rootlets, very scattered gravel-sized clasts. <u>LANDSLIDE DEBRIS (?)</u> ② Off white, moist, dense, silty fine to medium sand.		Qls (?)		SM					
		Total depth = 14' No ground water encountered No caving Backfilled 4/23/85									

GRAPHIC REPRESENTATION East Wall SCALE: 1" = 5' SURFACE SLOPE: 11° TREND: N25°E



Appendix C (continued)

AT-1 to AT-12

Exploratory Trenches

From:

Action Geotechnical Consultants, 1984a

LOG OF EXPLORATORY PITS

<u>Pit No.</u>	<u>Depth</u>	<u>Description</u>	<u>Attitudes</u>
1	0-1'	GREY/WHITE SAND with SILT and SANDSTONE fragments (old cut surface)	B N30E/5NW
	1-4' (bedrock)	GREY/WHITE SANDSTONE, massive, dense, very hard bed @ 1'	J E-W/82S J N55W/88SW
2	0-0.5'	GREY/WHITE SAND with SANDSTONE fragments (old cut surface)	
	0.5-7' (bedrock)	GREY/WHITE SANDSTONE, dense, massive	J N85W/85SW J N70W/85SW J N15W/88NE B N30E/5NW
3	0-5' (bedrock)	WHITE SANDSTONE, soft	
	5-6.5'	GREY/WHITE, clayey SANDSTONE, firm	
	6.5-7.5'	BROWN, sandy, clayey mudstone	
4	0-1.5- (bedrock)	WHITE SANDSTONE, firm	
	1.5-3.5'	GREY, clayey SANDSTONE	
	3.5-5'	GREY SANDSTONE, firm, very dense, WHITE SANDSTONE @ 5'	
5	0-6' (colluvium)	DARK GREY, silty CLAY with SAND, porous and scattered caliche and rock fragments, moist	
		Grades to DARK BROWN color and denser state @ 8'	
	8-10' (bedrock)	LIGHT BROWN, silty, fine SANDSTONE, moist and soft	
6	0-4' (slide debris/ colluvium)	DARK GREY to BLACK, silty CLAY with SAND and speckled with caliche	
	4-7.5'	DARK BROWN, silty CLAY with SAND and occasional round pebbles	
	7.5-13' (weathered bedrock)	BROWN, silty, fine SAND	
	13-14' (bedrock)	WHITE, fine SANDSTONE	



<u>Pit No.</u>	<u>Depth</u>	<u>Description</u>	<u>Attitudes</u>
7	0-3' (colluvium/ slide debris)	DARK GREY to BLACK, silty CLAY with SAND, porous	
	3-5'	DARK BROWN, silty, sandy CLAY, speckled with caliche	
	5-6.5'	Mottled BROWN and RUST BROWN clayey SAND	
	6.5-10'	LIGHT BROWN SAND, soft with pockets of DARK GREY CLAY and scattered SANDSTONE cobbles	
	10-12' (bedrock)	GREY/WHITE SANDSTONE, firm	
8	0-2' (slide debris)	GREY/BROWN, silty, fine grained SAND, very porous and dry	
	2-8'	DARK GREY, clayey SAND, slightly porous, speckled with caliche from 5'-6'	
	8-12'	BROWN, slightly clayey, fine to medium grained SAND with WHITE SANDSTONE fragments and pockets of DARK GREY, silty CLAY	
	12-14'	BROWN and WHITE, mottled SAND with traces of iron staining and organic material	
	14-19.5'	BROWN, fine to medium grained SAND with WHITE SANDSTONE fragments	
		Groundwater Seepage @ 16' and 19.5'	
9	0-5' (slide debris)	DARK GREY to BLACK, sandy CLAY with caliche @ 4'-5'	
	5-7'	BROWN and BLACK clayey SAND	
	7-16'	LIGHT BROWN, slightly clayey SAND, soft, locally contains intergrained caliche and rust staining	



<u>Pit No.</u>	<u>Depth</u>	<u>Classification</u>	<u>Attitudes</u>
10	0-5'	LIGHT BROWN/WHITE, fine	
	(fill)	grained SAND	
	0.5-1.5'	BLUE/GREY CLAY with	
		dry grass (organic smell)	
	1.5-3'	GREY/WHITE SAND	
	3-5'	Very fat, BLUE/GREY CLAY	
	(alluvial)		
		Groundwater @ 5'	
11	0-7'	LIGHT BROWN/WHITE, fine,	
	(Fill)	clayey SAND with SANDSTONE	
		fragments and trace of DARK	
		GREY CLAY	
	7-8.5	Very fat, BLUE/GREY CLAY	
	(alluvial)		
	8.5-10'	GREY, fine SAND, damp	
12		Groundwater @ 10'	
	0-3'	LIGHT BROWN and GREY/WHITE,	
	(alluvial)	fine grained SAND (caves)	
	3-8'	BLACK, fat CLAY with trace	
		of SAND	
	8-11'	GREY, sandy CLAY, damp	
		Groundwater @ 9'	



Appendix C (continued)

AB-1 through AB-8

Large-Diameter Borings

From:

Action Geotechnical Consultants, 1984a

SUMMARY SHEET

PROJECT

Mr. Thomas O. Weese

GEOLOGICAL DESCRIPTION								ENGINEERING CLASSIFICATION/DESCRIPTION									
Bedrock	133		6		2	4	6	8	10	x	12	14	16	18	GREY/BROWN, sandy CLAY		
															WHITE, fine grained sandstone		
															GREY/BROWN, clayey sandstone, moderately cemented		
															WHITE, medium to coarse sandstone, with cemented layers		
															WHITE, fine to medium sandstone		
															Very difficult drilling @ 16'		
															Refusal @ 17.5'		
															End @ 17.5'		
															No Water or Caving		

SUMMARY SHEET

PROJECT

Mr. Thomas Weese

GEOLOGICAL
DESCRIPTION

Slide
Debris

bedrock

ENGINEERING
CLASSIFICATION/DESCRIPTION

112

13

2

4

6

8

10

12

14

16

18

20

22

24

26

CORE

LOG AND LOCATION
OF SAMPLE

UNIFIED SOIL
CLASSIFICATION

GREY, silty SAND, dry,
loose

DARK GREY, clayey SAND/
sandy CLAY

RED, clayey, fine to
medium SAND, mottled with
DARK GREY, sandy clay
stringers, weathered
sandstone boulders @ 10'

BROWN and BLACKSAND with
trace of CLAY, weathered
chunks of sandstone @ 16'

GREY/WHITE, medium SAND
with trace of BLACK CLAY.
WHITE clay seam @ 18'

GREY, clayey SAND, seepage
@ 20'

WHITE, fine to medium
sandstone, 1/8" clay
seam & seepage @ 21'

Dense SANDSTONE @ 27'

End @ 27'

Seepage @ 20' & 21'

Caving @ 16' to 21'

BORING No. 2

SURFACE ELEV. see map

Bucket
EQUIP. Auger

HOLE DIA. 24"

LOGGED BY GW

JOB NO.

DATE

SHEET
OF

413701

6/11/84

2 9

SUMMARY SHEET

PROJECT

Mr. Thomas O. Weese

GEOLOGICAL DESCRIPTION								ENGINEERING CLASSIFICATION/DESCRIPTION		
slide debris					2				DARK GREY to BLACK, sandy CLAY, speckled with caliche @ 3'	
					4					
					6				GREY/BROWN, fine to medium SAND with pockets of DARK GREY sandy CLAY and WHITE SAND	
					8					
					10				LIGHT BROWN SAND with WHITE SAND, very moist @ 11'	
					12					
					14					
					16				Heavy Seepage @ 16'	
					18				LIGHT BROWN, fine to medium SANDSTONE, firm	
					20				WHITE, fine SANDSTONE, firm	
bedrock	116		15		22		x			
								End @ 22'		
								Groundwater @ 16'		
								Severe Caving 11' to 17'		
					CORE		BORING No. 3 SURFACE ELEV. see map EQUIP. Bucket Auger HOLE DIA. 24" LOGGED BY GW			
							JOB NO.	DATE	SHEET OF	
							413701	6/11/84	3 9	

SUMMARY SHEET

OBJECT

Mr. Thomas O. Weese

GEOLOGICAL DESCRIPTION		ENGINEERING CLASSIFICATION/DESCRIPTION						
Bedrock					2			LIGHT BROWN CLAY, fine SANDSTONE
					4			LIGHT GREY, fine SANDSTONE with clayey SANDSTONE lenses @ 4'
					6			WHITE, fine SANDSTONE Pinkish tone @ 6'
					8			
					10			Clayey SANDSTONE lenses @ 11'
					12			GREY/BROWN, sandy, clayey MUDSTONE
					14			GREY, clayey SANDSTONE
					16			BROWN SANDSTONE with trace of CLAY, very dense
					18			WHITE, fine SANDSTONE, very dense, refusal
								Refusal @ 18' End @ 18' No Groundwater or Caving

SUMMARY SHEET

OBJECT

Mr. Thomas O. Weese

GEOLOGICAL DESCRIPTION		ENGINEERING CLASSIFICATION/DESCRIPTION						
Slide Debris			26	4 3 5	5		X	DARK GREY, sandy CLAY Mottled LIGHT BROWN, silty CLAY with caliche
			16	8 8 11	10		X	Firms @ 7' GREY/WHITE SAND
			19	11 20 24	15		X	BROWN, clayey SAND, bentonite seam @ 15' groundwater @ 18'
Bedrock			15	38 50 (4")	20		X	WHITE, fine to medium SANDSTONE
			17	25 36 50 (5")	25		X	WHITE to LIGHT BROWN SANDSTONE, difficult drilling below 25'
			11	50 (5")	30		X	WHITE, fine to medium SANDSTONE
								End @ 30'
TP: standard penetration							CORE	BORING No. 5 SURFACE ELEV. see map Hollow Stem EQUIP. Auger MOLE DIA. 8" LOGGED BY GW
	DRY DENSITY lbs./cu. ft.	RELATIVE COMPACTION	MOISTURE %	PENETRATION N (STP)	DEPTH IN FEET	LOG AND LOCATION OF SAMPLE	UNIFIED SOIL CLASSIFICATION	JOB NO. 413701 DATE 6/13/84 SHEET OF 5 9

SUMMARY SHEET

OBJECT

Mr. Thomas O. Weese

LOGICAL DESCRIPTION									ENGINEERING CLASSIFICATION/DESCRIPTION		
Fill	99	87	21	5 17				x		LIGHT GREY/WHITE, clayey SAND	
	98	86	22	9 16	5			x			
Alluvium	103		27	10 15	10			x		DARK GREY, fat CLAY Groundwater @ 13'	
	109		16	12 17	15			x		GREY, sandy CLAY, wet	
	102		24	8 15	20			x		GREY, clayey SAND with coarse SAND lenses	
			13	9 11	25			x		GREY, coarse SAND	
			21	4 7 6	30			x		GREY/BROWN, clayey SAND Dense below 34'	
			16	6 9 16	35			x		BROWN to REDDISH BROWN, fine to medium SAND with trace of coarse SAND	
			9 10 12	40			x		BROWN to REDDISH BROWN, medium to coarse SAND with pebbles		
								CORE	BORING No. 6 SURFACE ELEV. see map Hollow Stem EQUIP. Auger HOLE DIA. 8" LOGGED BY GW		
		DRY DENSITY lbs./cu. ft.	RELATIVE COMPACTION	MOISTURE %	PENETRATION N (STP)	DEPTH IN FEET	LOG AND LOCATION OF SAMPLE	UNIFIED SOIL CLASSIFICATION	JOB NO. 413701 DATE 6/13/84 SHEET OF 6 9		

SUMMARY SHEET

PROJECT

Mr. Thomas O. Weese

GEOLOGICAL DESCRIPTION								ENGINEERING CLASSIFICATION/DESCRIPTION			
Bedrock			12	14 31 42	45		x		LIGHT BROWN/TAN, medium to coarse SANDSTONE		
			13	17 22 42	50		x		WHITE, fine to medium SANDSTONE		
									End @ 51'		
	DRY DENSITY lbs./cu. ft.	RELATIVE COMPACTION	MOISTURE %	PENETRATION N (STP)	DEPTH IN FEET	LOG AND LOCATION OF SAMPLE	CORE	UNIFIED SOIL CLASSIFICATION	BORING No. 6 (continued) SURFACE ELEV. see map Hollow Stem EQUIP. Auger HOLE DIA. 8" LOGGED BY GW		
									JOB NO.	DATE	SHEET OF
									413701	6/13/84	7 9

Mr. Thomas O. Weese

GEOLOGICAL DESCRIPTION

Mr. Thomas O. Weese

ENGINEERING
CLASSIFICATION/DESCRIPTION

Alluvium

22

1
2
1

5

x

DARK GREY, clayey, medium
to course SAND

4

1

1

1

X

DARK GREY, clayey, fine
SAND, wet

17

4

4

6

x

DARK OLIVE GREY, fine
sandy CLAY

14

31
50
(2")

20

X

WHITE, medium to coarse
SANDSTONE

Bedrock

DRY DENSITY
lbs./cu. ft.

**RELATIVE
COMPACTION**

MOISTURE %

PENETRATION N (STP)

DEPTH IN FEET

LOG AND LOCATION OF SAMPLE

CODE

UNIFIED SOIL CLASSIFICATION

BORING No. 7

SURFACE ELEV. see map

EQUIP. Hollow Stem
Auger HOLE DIA. 8"

LOGGED BY PA

JOB NO.

413701

DATE _____

6/13/84

SHEET

8 OF 9

SUMMARY SHEET

PROJECT

Mr. Thomas O. Weese

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